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HOW AFRICA CAN ACHIEVE THE SUSTAINABLE DEVELOPMENT GOALS

Version 2, November 2017

THE SUSTAINABLE DEVELOPMENT GOALS CENTER FOR AFRICA

supported by:

JICA

SDG Center for Africa

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

The Sustainable Development Goals Center for Africa (SDGC/A) is an international organization that supports citizens, governments, civil society, businesses and academic institutions to accelerate progress towards the Sustainable Development Goals (SDGs) in Africa.

Following the historic adoption of a new sustainable development agenda by the United Nations General Assembly in September 2015, African leaders decided to take quick and firm action by establishing the Center as a home-grown African institution – championing the implementation of the SDGs in line with the principles of African Union's 2063 Agenda. By agreeing to establish an African owned Center with trusted technical expertise, African leaders want to ensure that they act together in pursuit of a shared African development vision.

Opened in July of 2016 at its headquarters in Kigali, Rwanda, the Center aims to build upon Africa's existing success with the Millennium Development Goals by bringing together people, ideas and innovations to collectively reach a more sustainable future.

Acknowledgements

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The SDGC/A would like to thank everyone who directly or indirectly contributed to this report, with special recognition to the Program Committee of the SDGC/A Board of Directors for their guidance and support.

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Authors and Contributors

As this second Version builds up on the Africa 2030 Report Version 1, we recognize the authors and contributors of this first version.

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TABLE OF CONTENTS

VOLUME 1 7

FOREWORD 8

EXECUTIVE SUMMARY 11

1 KEY POLICY BREAKTHROUGHS NEEDED FOR THE SUSTAINABLE DEVELOPMENT GOALS IN AFRICA 17

2 THEMATIC CHAPTERS 22

Health 23

Education 28

Agriculture, Food, Production and Nutrition 33

Information and Communication Technology (ICT) 38

Energy and Infrastructure 49

Jobs 51

Demography 54

Climate Change 58

3 REGIONAL CHAPTERS 62

Central Africa 70

East Africa 84

North Africa 100

Southern Africa 112

West Africa 123

TABLE OF CONTENTS

VOLUME 2 138

4 HOW TO GET STARTED WITH THE SDGS 140

I. Planning 141

II. Monitoring 144

III. Assessment to Identify Key Indicators that need to be tracked for the Achievement of the SDGs – Country Cases 150

IV. Overview of Countries' current Capacity on Data Collection and Analysis 150

V. Monitoring, Evaluation and Reporting tools: SDG Index, SDG Dashboard, Data Visualization Platform, Citizen Report 153

5 INVESTMENT ASSESSMENT 162

I. Education 164

II. Health 171

III. Infrastructure, Electricity 178

IV. Finance 192

BIBLIOGRAPHY 196

ANNEX 1: 2017 IBRAHIM INDEX OF AFRICAN GOVERNANCE FRAMEWORK 202

ANNEX 2: TRANSPARENCY INTERATIONAL 2016 CORRUPTION PERCEPTIONS INDEX: AFRICA 204

ANNEX 3: COSTING TEMPLATES 206

ACRONYMS

AfDB	African Economic Community
AMU	Arab Maghreb Union
AU	African Union
BEAC	Bank of Central African States
CAR	Central African Republic
CENSAD	The Community of Sahel-Saharan States
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
DOTS	Directly Observed Treatment Short course
FDI	Foreign Direct Investment
FfD	Financing for Development
GDP	Gross Domestic Product
GNI	Gross National Income
HDI	Human Development Index
HIPC	Heavily Indebted Poor Country Initiative
IEA	International Energy Agency
ICT	Information and Communication Technology
IGAD	Intergovernmental Authority on Development
JICA	Japan International Cooperation Agency"
LIC	Low Income Countries
MIC	Middle Income Country
MDGs	Millennium Development Goals
M&R	Monitoring and Reporting
NEPAD	New Partnership for Africa's Development
ODI	Overseas Development Institute
PIDA	Programme for Infrastructure Development in Africa
RAI	Rural Access Index
ROCKS	Road Costs Knowledge System
SADC	Southern African Development Community
SADCC	Southern African Development Coordination Conference
SCI	Stastical Capacity Indicator
SDGs	Sustainable Development Goals
SSA	Sub-Saharan Africa
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa
USD	United States Dollar
WAEMU	West African Economic and Monetary Union
WB	World Bank
WEF	World Economic Forum
WTO	World Trade Organization

VOLUME 1

FOREWORD

His Excellency Paul Kagame, President of the Republic of Rwanda, gives the keynote address during the Sustainable Development Goals Center for Africa Conference: Expediting the Implementation of SDGs Agenda in Africa. 27 January 2017, Kigali, Rwanda.

One of the main takeaways from the MDGs was the need for two things: disaggregated data and timely, accurate and reliable standardized data, especially in African countries. At the end of the MDGs, we saw reports broadly analysing the continent's performance and articles highlighting which African countries achieved and did not achieve specific MDGs. However, given the large amount of data collected in each country over the course of 15 years, governments could benefit from country-specific reports to support the planning process for Agenda 2063 as well as the SDGs. Unfortunately, these reports could not be produced.

FOREWORD

In an attempt to shed more light on the MDG results in Africa, we are delighted to present the second edition of the Africa 2030 Report. This report serves to provide a general overview of where Africa and African nations stand at the end of the Millennium Development Goals (MDGs) and to act as a guide to African governments and policy makers in their strategic planning process to develop targets and benchmarks for the SDGs. In particular, this 2nd Version of the report includes a brand new Volume II which provides an Investment Assessment for several key areas of the SDGs and greater detail on monitoring, evaluation and reporting systems that are being, or will be, used to track SDG progress. We believe that this is a key exercise that will allow countries to use our templates to come up with their own estimates for needs to meet specific areas of the SDGs. Finally, this version is the result of the JICA peer review forum, where thematic experts from across the continent gathered to provide substantial feedback on the content of the report in order to improve its quality.

The report consists of:

- Regional and sectoral analysis of the key aspects of the SDGs
- Best practices and key areas that require extra attention that have contributed to the success of the MDGs and will continue to affect the success of the SDGs
- Backcasting tool for governments on how to get started on the SDGs
- Overview of the Center's vision and monitoring and reporting strategy for the SDGs
- Costing tools for achieving the SDGs related to education, health, energy and infrastructure

The SDGs build on the successes of the MDGs, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace, and justice, among other priorities. They are more inclusive and comprehensive than the MDGs. There are 17 SDGs spanning a multitude of sectors and they are no longer restricted to low- and medium income countries. They represent a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. Additionally, the SDGs were developed on the recognition that there are inherent synergies between all the goals; they are interconnected. Successfully addressing one issue will inadvertently also tackle others.

It is not a simple or easy task for African nations to achieve the SDGs by 2030 and the African Union's Agenda 2063. It will require key breakthroughs in policies in seven key areas: health, education, agriculture and food security, energy and infrastructure, information and communication technology, demography, and jobs. Additionally, there need to be increased levels of public and private financing, creation and diffusion of new technologies and improved governance and accountability in all of the various sectors of the SDGs.

We must take advantage of the synergies across goals, acknowledging that pursuing one goal is co-dependent on policies and investments in other goals or sectors. Synergies and trade-offs are widespread in the SDG agenda and they need to be taken into consideration to properly leverage them. For instance, investment in energy access will have positive spillovers in health and education outcomes, as more health and education facilities will be connected to the grid. Furthermore, the sturdiest synergies are seen in

agriculture, nutrition, and food security. Investment or policies in any of those areas will also impact water and land resources, biodiversity, health, and climate. We welcome policies that take into consideration such synergies so that they can be magnified.

As the Sustainable Development Goals Center for Africa (SDGC/A), we are committed to supporting governments, civil society, businesses and academic institutions to accelerate progress towards the SDGs. We are working with African countries in the integration of SDGs with national development planning processes, the domestication of the SDGs and the introduction of mechanisms for tracking progress through robust monitoring and evaluation and reporting systems. For this, we are preparing an SDG African Index that will be launched with a comprehensive report in 2018. Additionally, we have developed templates to guide national governments with estimating and budgeting the cost to achieve the SDGs for health, education, energy and infrastructure in their countries. Furthermore, we are working with the National Development Banks, devising an effective and innovative strategy for SDG financing.

The Center is currently involved in the development of initiatives to structure financing for the SDGs through African development banks, the establishment of the Kigali Initiative in July 2017 which calls on African universities to improve the quality and standing of tertiary education, identifying sustainable development pathways with Stockholm Resilience Centre, and expanding the use of IT solutions and other vital innovations, to mention just a few.

As the Center grows and expands its coverage of the continent, I look forward to facilitating synergies between governments, businesses, civil society and academia to accelerate the achievement of the SDGs and Agenda 2063.

Belay Begashaw, Ph.D.
Director General

Signing of Memorandum of Cooperation with The Sustainable Development Goals Center for Africa and the Japan International Cooperation Agency.

From Left, Dr. Belay Begashaw, Director General of SDGC/A, and Mr. Shinichi Kitaoka, President of JICA, during the signing of Memorandum of Cooperation at the JICA headquarters in Tokyo in 2017.

EXECUTIVE SUMMARY

The SDGs provide time-bounded goals and targets in key sectors – including health, education, agriculture, energy, infrastructure and the environment – for all nations to achieve. For Africa, the SDGs present enormous challenges and opportunities. The vision of the Center, which is shared by all African leaders, is to ensure that all African countries achieve their national targets for the SDGs by 2030. The purpose of the Center is to provide technical knowledge and serve as a wisdom-sharing platform for and between national governments, private sector, civil society, and academic institutions to accelerate the implementation of the SDGs and the African Union's Agenda 2063 across Africa.

We firmly believe that the biggest issues that Africa faces are structural in nature and that the SDG framework should address these structural issues head-on. SDGs should be understood as investment projects, unprecedented investment of magnitudes that African nations are not capable of balancing without external loans and grants. Most importantly, the fact that Africa remains a net capital exporter is a structural issue that needs to be addressed on a global level. Between 2005 and 2011, sub-Saharan Africa had the largest growth in Total Assets in Offshore Financial Centers, surpassing 20%, and the losses related to mineral misinvoicing are up to $50 billion on the continent (UNECA High Level Panel report on Illicit Financial Flows). The discussion needs to shift away from the ODA flows, whether they are scarce, or sufficient, or whether they should come from particular sources. The issue that needs to come under public scrutiny is that no matter how much aid or FDI African nations are able to attract, if the current set-up of tax havens and illicit financial flows persists, Africa will be unable to finance its own growth.

We are fully committed to involving the relevant actors in raising awareness of the harmful effects of illicit flows on African nations. We are calling upon governments and international institutions not only to combat this menace in order to promote sustainable development, but also to revert this trend and devise how the magnitudes of financial flows that Africa has seen drifting away for more than a century can be turned into direct investment for the achievement of the SDGs and the Agenda 2063 for Africa.

Conversely, we want to transform Pan African challenges into opportunities. For example, the demographic landscape of the continent poses a real threat to the achievement of the SDGs. Fertility rates need to be reduced effectively, but we like to think of this population dynamic as a global competitive advantage; by 2050 nearly half of the world's under 35 population will live in Africa (UN Population Division's Medium Variant Projection, 2015). Fertility rates are below replacement in most developed countries and in a number of developing countries. This demographic dividend poses a great opportunity for the continent as the labor market will be shifting and aged populations in Europe and other regions will need to be replaced by young African generations. According to the UN, by the end of this century Africa will be home to 39% of the world's population, almost as much as Asia, and four times the share of North America and Europe put together. We want to turn these new generations into global leaders and game changers who will structurally transform the continent.

Leveraging the Center's core value of neutrality and its advantage in terms of speed and flexibility to intervene and connect relevant networks at various levels, it aims to build upon Africa's existing successes by bringing together people and ideas to collectively reach a more sustainable future. In our capacity as a platform engaging government, development partners, academics and citizens with innovative solutions, we will measure our success by how dispensable we make ourselves, ensuring that the knowledge and capacity is built and retained in African minds. We acknowledge this is a long journey, and instead of sprinting

it, we welcome all development marathoners to come together and, as one, construct a culturally strong, prosperous, socially equal and environmentally sustainable Africa.

The Africa 2030 Report serves as a call for immediate action and help to disseminate the sense of urgency required in catching up with the SDGs. This reports represents a comprehensive and in-depth research study, to assess the region's performance on the achievement of the MDGs, to understand what hindered their complete achievement, and to recognize best practice moving forwards. This analysis assesses where each region is currently standing in economic, social and environmental terms in order to achieve the SDGs. It stresses the consequences and future scenarios if existing approaches are not changed. Furthermore, it elaborates sectoral costing templates that will help countries to regard the achievement of SDG targets as investment plans, and presents cost effective tools to help governments get started with the planning, implementation and monitoring and evaluation of the SDGs.

Overview

The achievement of sustainable development is the defining challenge for Africa in the 21st century. By integrating economic growth, social inclusion and environmental sustainability, African nations must forge a new model of progress – one that is needed for the continent, and the wider world. Despite significant economic progress, a reduction in poverty rates and improvement in infrastructure since 2000, African nations still struggle with widespread poverty, disease, lack of energy and basic infrastructure, and growing environmental stress. As of 2012, 43% of Africans still live under the poverty line according to the World Bank, 600 million people do not have access to electricity, and millions die every year from preventable diseases. The relentless population growth in Africa, and the increasing impacts of climate change, present two major threats to continued economic progress for the continent.

However, the SDGs are also a significant opportunity for Africa to lead the world in pioneering solutions to sustainable development problems. Africa is home to abundant natural resources, entrepreneurial people and improving political governance. These resources, if properly managed and directed, can create break-through solutions for the long-term sustainable development of the continent. To achieve the SDGs, African governments, businesses, civil society and universities will need to collaborate in unprecedented ways.

African nations must attempt to achieve the SDGs now, as many of the challenges will become unmanageable if left unattended. For example, according to the World Bank, climate change of 2°C could contribute to farmers losing 40-80% of cropland conducive to growing maize, millet, and sorghum by the 2030s-2040s (World Bank, 2014). The adult workforce is to set to grow by another 70%, to approximately 800 million people, by 2030. The time for action is now.

Progress - MDGs

Africa has experienced significant economic progress since 2000. There are several factors helping to explain this progress. The Millennium Development Goals (MDGs) were a powerful framework to focus political attention, financial resources and investments on the fights against poverty and preventable disease. Debt cancellation under the HIPC program, in part spurred by the MDGs, gave financial space for the restoration of public investment in many African nations. The revolution in Information and Communication Technology (ICT) helped spread mobile telephony, online banking, E-Health and other technologies throughout the continent. And, finally, the cessation, or at least diminution, of several regional conflicts (including Liberia, Sierra Leone, Sudan and Somalia) on the continent helped support economic recovery in those regions. The results are

EXECUTIVE SUMMARY ... continued

noteworthy: extreme poverty fell from 56% to 43% from 1990-2012, economic growth averaged over 5% annually, primary education enrollment reached 77%, and disease prevalence in Africa dropped by over 50% for HIV/AIDS, Tuberculosis and Malaria. Though all countries did not achieve all of the MDGs, there were significant gains made throughout the continent.

During this period, Africa also benefited from a constructive external economic environment. Global economic growth averaged approximately 3-4% per year during the MDG period, with a marked acceleration of growth in emerging economies. Specifically, Africa benefited from the continued economic growth of the Chinese economy. From 2000-2015, the economy of China grew from $1.2 trillion to $10.8 trillion of Gross National Product. China's investment-led growth proved to be especially fruitful for Africa, creating significant demand for Africa's natural resources. From 2003-2012, trade between Africa and China increased approximately 10-fold from $19 billion to over $200 billion.

Call for Action - SDGs

Despite recent successes, the continued economic development of Africa is not guaranteed. This is true for three related reasons. First, African economic growth was uneven throughout the continent and, on the whole, not inclusive enough in many countries. Extractive industries – oil, gas and the broader mining sector – have accounted for a significant share of Africa's growth, but have not created sufficient employment or job opportunities for a majority of the labor force. Second, the natural environment has deteriorated in much of the continent due to the forces of anthropogenic climate change. The number of floods, for example, has tripled over the past decade compared to the previous one. Third, Africa faces significant demographic challenges. The median UN population trajectory forecasts a four-fold increase in the African population by 2100. Africa must begin to experience a demographic transition if it is to achieve sustainable development this century.

The SDGs are significantly more ambitious than the MDGs. Whereas the MDGs targeted poverty in a broad manner and basic health and education issues, the SDGs take a holistic approach to economic development as a whole, and therefore require larger and more complex solutions.

Sectoral Analysis

Comprising eight sectors – Health, Education, Agriculture, Energy and Infrastructure, Information and Communication Technology (ICT), Jobs and Demography – the sectoral analysis is a comprehensive overview of each sector landscape, outlining major challenges each sector faces and listing key interventions and best practices drawn from the MDG agenda. This analysis will not only allow valuable insights from lessons learnt from the MDGs, but also set the baseline for each SDG, allowing a qualitative and quantitative understanding of what needs to be done in each sector in order to achieve each SDG by 2030.

Regional Analysis

Given that the three main pillars for sustainable development are economic growth (Economic Growth, Poverty and Infrastructure and Energy), social inclusion (Health, Education and Gender and Inequality) and environmental sustainability (Climate change and Water and Sanitation), this section will address each of them by sub-region: Central, East, North, Southern and West Africa. It acknowledges that each African region has unique economic, social and environmental ecosystems, challenges to address, and opportunities to leverage.

The sub-regional analysis, which has clustered African countries into five regions based on the African Development Bank Guidelines (AfDB, 2016), provides a comprehensive local appraisal of problems faced by countries that share similar topographies, cultures and economies. It aims to identify regional challenges and propose regional policy priorities to be addressed. African leaders have recognized regional integration as a means to support Africa's economic development through a desire to build a common market for goods and services. The Programme for Infrastructural Development in Africa (PIDA) seeks to work with national governments to achieve this goal through improving access to integrated regional and continental infrastructure networks. PIDA further allows countries to meet forecast demand for infrastructure services and boost competitiveness by: increasing efficiencies; accelerating growth; facilitating integration in the world economy; and improving living standards and unleashing intra-African trade (PIDA, 2015). Specific sub-regional PIDA projects are included in each sub-section.

How to Get Started with the SDGs

The SDGs are integrated and inclusive. They move away from siloed development approaches, recognizing the interconnectedness between the pillars of sustainable development and the role state and non-state actors play in achieving it. The SDGs encourage countries to benefit from synergies across sectors that naturally build partnerships between ministries, institutions and stakeholders. The public management system of African governments that is responsible for shepherding this process must adapt its planning and implementation tools to meet these new needs. Tools such as backcasting analyses can be very useful as governments prepare their long-term investment strategies for the SDGs.

Investment Assessment

The global financial sector will be at the center of attempts to achieve the SDGs. Recent estimates indicate that the SDGs will require an additional US$2.4 trillion of annual public and private investment into the low-carbon infrastructure, energy, agriculture, health, education and other sustainable sectors globally. In an effort to transform the SDGs Agenda into practical investment action plans, the SDG Center is developing costing templates to support national governments in gaining a better understanding of the domestic and international resources needed to achieve the SDGs by 2030.

These templates are meant to be customized by each country and adapted to its national plans, interventions and needs. This tool intends to provide governments with guidelines to estimate what investment amounts may be needed, using an average cost calculated by experts for a base level package of interventions and activities. These estimates will give governments a sense of where they are financially and enable them to devise a strategy to close the funding gap. These costing models are based on rigorous literature reviews of published studies and reports that have attempted to cost the achievement of the SDGs in four areas: education, health, energy and infrastructure.

SDGs Monitoring and Reporting System

The success of the SDG Agenda depends heavily on efficient and robust monitoring of its progress. In the African context, much needs to be done – and it must be a priority. National Statistic Institutes (NSI) need to strengthen their capacities and modernize their systems to handle quality, accessible, timely and reliable disaggregated data, in order to measure progress and ensure accountability to achieve

EXECUTIVE SUMMARY ... continued

Panel Discussion of Africa 2030: How Africa Can Achieve The Sustainable Development Goals during the plenary session of the SDGC/A Conference: Expediting the Implementation of SDGs Agenda in Africa.

From Left: Mr. Admassu Tadesse, President and Chief Executive Officer of Eastern and Southern African Trade and Development Bank; Mr. Sindiso Ngwenya, Secretary-General of COMESA; Dr. Belay Begashaw, Director-General of SDGC/A; Honorable Claver Gatete, Minister of Finance and Economic Planning of Rwanda; and the moderator of the panel discussion Ms. Bronwyn Nielsen, Executive Director, ABN Group and Head of Programming, CNBC Africa.

the SDGs by 2030. Enhancing national Monitoring, Evaluation and Reporting (M&R) Systems will allow governments to improve their management and governance processes by reviewing the design, implementation and results of ongoing SDG-related policies. Furthermore, it will augment accountability by publicly measuring policies' impact and reach and allowing decision makers to modify them and allocate resources accordingly.

The MDGs data were only intermittently available or delayed in the majority of countries. It was often incomplete and of poor quality, thus making it insufficient to serve as either a reliable governmental management tool or a real-time report card for the achievement of the MDGs. One of the key takeaways from the MDGs was the need for disaggregated, timely, accurate and reliable standardized data and an M&R system in each country. The benefits of such a system include better and improved decision-making, accountability, implementation and managerial capacity building, and greater governmental responsiveness and participation. Additionally, the deployment of a complete M&R system will synergize investment needs in other sectors. Investments in data for better monitoring of policies will catalyze donations and/or private investment in interventions with proven impact and, at the same time, will direct more resources to sectors that are lagging behind.

In 2015, the Millennium Development Goals – launched in 2000 to drive global progress in poverty, education, health, hunger and the environment – expired and a new set of goals replaced them. The Sustainable Development Goals set out specific targets to end poverty, protect the planet, and ensure prosperity for all by 2030.

1 NO POVERTY
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SUSTAINABLE DEVELOPMENT GOALS

1 KEY POLICY BREAKTHROUGHS NEEDED FOR THE SUSTAINABLE DEVELOPMENT GOALS IN AFRICA

1

The pursuit of sustainable development is the defining challenge for Africa in the 21st century. By integrating economic growth, social inclusion and environmental sustainability, African nations must forge a new model of progress – one that is needed for the continent, and around the world.

In September 2015, the 193 member-states of the United Nations adopted seventeen Sustainable Development Goals (SDGs) as the organizing principle for development policy and cooperation through 2030. The SDGs provide time-bounded goals and targets in key sectors – including health, education, agriculture, energy, infrastructure and the environment – for all nations to achieve. For Africa, the SDGs will present enormous challenges and opportunities.

WHAT THE SDGS WILL REQUIRE

The SDGs are significantly more ambitious than the MDGs. Whereas the MDGs targeted poverty and health, the SDGs take a holistic approach to economic development as a whole, and therefore require more expansive and complex solutions.

To achieve the SDGs by 2030 will not be a simple task for African nations. It will require key breakthroughs in policy (both international and domestic), increased levels of public and private financing, the creation and diffusion of new technologies, and improved governance and accountability in all of the various sectors of the SDGs.

KEY BREAKTHROUGHS REQUIRED

HEALTH

SDG 3 calls for universal health care coverage. For this to be achieved, highly functioning health systems must be developed and strengthened across the continent. Africa nations will require a scale-up in international public finance to support health systems development to do this. As of 2013, only six countries – Rwanda, Liberia, Malawi, Zambia, Togo and Madagascar – had achieved the Abuja Target of 15% of annual government budget expenditure for health. International public finance will be critical in closing the gap. In addition, the strengthening of health systems through innovations such as the scaling up of Community Health Workers (CHWs) will be required across the continent. Since CHWs are regular individuals living in the communities they serve, they can play a critical role in connecting community members to primary healthcare that may otherwise be inaccessible to them. Through key interventions, CHWs could prevent up to 3 million deaths per year and can result in an economic return of up to 10:1 (Dahn, 2015).

EDUCATION

SDG 4 calls for universal primary and secondary education to be achieved by 2030. This will require the development of strong IT-enabled educational systems with emphasis on educational inclusion and learning outcomes for all

KEY POLICY BREAKTHROUGHS NEEDED FOR THE SUSTAINABLE DEVELOPMENT GOALS IN AFRICA

1

Mobile charger in a shop in Rwanda.

students. Assistive technologies, which can be tailored to the needs and contexts of students, will foster the development of more inclusive and equitable education systems and increase "the potential to promote gender equality, reduce inequalities, develop teacher and system capabilities, and encourage supportive learning environments. These various efforts will, in turn, contribute to overall improvements in educational quality" (UNESCO, 2017). Globally, the financing gap for universal primary and secondary education is estimated to be $40 billion per year. Given that over half of the out-of-school population of 59 million children reside in Africa, this means approximately $20 billion in additional annual financing is required for African countries. Furthermore, considering that Africa is home to nearly a quarter of the world's population aged under 25, there is an alarming mismatch between proper tertiary education supply and current and potential demand. Henceforth, mobilizing resources and synergizing efforts to strengthen quality graduate and postgraduate education must be at the core of the discussion.

AGRICULTURE AND FOOD SECURITY

Many countries in Africa are struggling to meet their food needs. Despite enormous potential in agriculture, Africa has 65% of the world's arable land, according to AfDB, but is a net importer of food, spending $35 billion on food imports annually. Out of 874 million hectares of land that is considered suitable for agricultural production, over 80% suffers from serious soil fertility challenges or other limitations to achieving high and sustained productivity. Africa requires a significant improvement in agricultural productivity and resiliency to achieve sustainable growth and development. Food demand in Africa is expected to rise by over 60% by 2050 due to population growth and improvements in nutrition, while climate change is predicted to significantly affect arable land health and agricultural output. As listed in the targets of SDG 1 and 2, African governments must support access to improved seeds, development of sustainable irrigation systems, and sustainable use of fertilizers and agro-inputs, and must accelerate other key elements of improved agricultural systems on the continent.

ENERGY AND INFRASTRUCTURE

SDG 7 calls for sustainable energy access for all and SDG 9 for the development of resilient infrastructure. These goals are critical for sustainable development in Africa. Insufficient infrastructure and energy supply/provision remain a major impediment throughout the continent, costing it over 2% of GDP growth per year. African governments must attract an additional $50-100 billion per annum in public and private finance for infrastructure development in sectors such as energy, transportation, water and sanitation. This will require scaling up capital market financing and development bank financing for infrastructure. In addition, African governments should further accelerate the Programme for Infrastructure Development in Africa (PIDA).

INFORMATION AND COMMUNICATION TECHNOLOGY

Information and Communication Technology (ICT) is the backbone of sustainable development in Africa. ICT impacts all sectors – including health, education, infrastructure, agriculture and so forth – and has been a major enabler of recent economic success on the continent. For example, the mobile communications industry in sub-Saharan Africa reached 367 million mobile subscribers in mid-2015 and is still expected to grow from the current penetration rate of 41% to 49% by 2020. Similarly, broadband connections are set to increase from 24% of the connection base today to almost 57%, with a total of 400 million individuals using mobile devices to access the internet in 2020. ICT must continue to expand throughout the continent and reach the currently isolated geographies and communities. The further diffusion of ICT will play a defining role in the achievement of the SDGs.

KEY POLICY BREAKTHROUGHS NEEDED FOR THE SUSTAINABLE DEVELOPMENT GOALS IN AFRICA

1

DEMOGRAPHY

Africa is the only region of the world that has not yet experienced a demographic transition to low rates of mortality and fertility. The lack of a full demographic transition in Africa is the most important single internal bottleneck to Africa's successful development in the next generation. The dangers of high fertility and mortality are pervasive - they affect educational attainment, dependency ratios, the adequacy of infrastructure, and many other key determinants of long-term economic development. Africa's population is increasing at a startling rate. According to the medium-fertility trajectory identified by the UN, Africa's population is slated to increase to 3.8 billion by 2100, a remarkable four-fold increase this century, and an overall 20-fold increase between 1950 and 2100. For Africa to begin to benefit from a demographic transition, there will need to be a significant increase in family planning, female education, job creation for the growing youth population and improved poverty alleviation interventions.

Solar energy powered barber shop in Tanzania.

JOBS

SDG 8 calls for the promotion of sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. African nations will need to meet a significant job-creation challenge if they are to achieve SDG 8. The ILO predicts that, by 2030, sub-Saharan Africa's working age population will grow to 793 million, a 70% increase from current levels. To achieve this level of job-creation, African nations will need to devise and implement holistic job-creation strategies that tackle challenges in education, infrastructure, job training, agricultural productivity-enhancement, and other related issues. Specifically, reversing the trend of "de-industrialization" – the decreasing contribution of manufacturing as a percentage of GDP – will be critical for the achievement of SDG 8.

NEW TOOLS

The SDGs are integrated and inclusive. They move away from siloed development approaches, recognizing the interconnectedness between the pillars of sustainable development and the role state and non-state actors play in achieving it. The SDGs encourage countries to benefit from synergies across sectors that naturally build partnerships between ministries, institutions and stakeholders. The public management system of African governments that is responsible for shepherding this process must adapt its planning and implementation tools to meet these new needs. Tools such as back-casting analyses can be very useful as governments prepare their long-term investment strategies for the SDGs.

2 THEMATIC CHAPTERS

This section provides overviews of key aspects of the SDGs in Africa

- Health
- Education
- Agriculture
- Energy and Infrastructure
- ICT
- Jobs
- Demography
- Climate Change

HEALTH

Caring for a mother at a maternal health clinic in Rwanda.

I. INTRODUCTION

SDG 3 aspires to ensure health and well-being for all, including a commitment to end the epidemics of HIV/AIDS, Tuberculosis, Malaria and other communicable diseases by 2030. It also aims to achieve universal health coverage, and provide access to safe and effective medicines and vaccines.

Africa has achieved noteworthy progress in health through the MDGs, especially in terms of under-five mortality rates, maternal deaths, and reducing the prevalence of HIV/AIDS (UNECA, 2015). For instance, 43 African countries observed more significant decreases in child mortality in the three years 2000-2013 than in the decade 1990-2000 (UNECA, 2015). Key interventions and services attributed to this are the Directly Observed Treatment Short course (DOTS) for tuberculosis; a greater prevalence of insecticide treated bed nets and Artemisinin-based combination therapies for malaria; and the use of antiretroviral therapy and condoms for HIV/AIDS (UNECA, 2015).

Despite this progress, the African region did not meet the health-related MDGs. Chronic and catastrophic disease remains one of the main factors that push households from poverty into deprivation. The African region lags behind other regions of the world on practically all indicators of health (see table of global disease burden overleaf), with communicable diseases accounting for approximately two-thirds of the disease burden, and non-communicable

REGIONAL RANKING OF LEADING CAUSES OF DISEASE BURDEN, MEASURED IN DISABILITY-ADJUSTED LIFE-YEARS (DALYS), 2011

CAUSE	Africa	Americas	South-East Asia	Europe	Eastern Mediterrannean	Western Pacific	Global
Lower respiratory infections	1	9	1	14	1	10	1
HIV / AIDS	2	19	15	16			6
Diarrhoeal diseases	3		3		3		4
Malaria	4						13
Preterm birth complications	5	13	4		2	15	5
Birth asphyria and birth trauma	6		7		5	17	9
Protein-energy malnutrition	7				18		
Meningitis	8				20		
Congenital anomalies	9	12	10	19	9	14	11
Road injury	10	5	8	8	7	4	8
Neonatal sepsis and infections	11		20		13		
Iron deficiency anaemia	12		11		11		15
Stroke	13	6			14		16
Endocrine blood immune disorders	14	16			17	16	17
Maternal conditions	15						
Ischaemic heart disease	16	1	2	1	4	2	2
Tuberculosis	17				14	20	16
Unipolar depressive disorders	18	2	12	3	6	5	10
Interpersonal violence	19	3					
Epilepsy	20						

RANKING LEGEND 1-5 6-14 15-20 No ranking

Source: WHO, 2014.

diseases, including mental health and injuries, accounting for the rest (WHO, 2014). The 2013-2015 West Africa Ebola outbreak, which caused over 28,000 deaths, mainly in Liberia, Sierra Leone and Guinea, is proof of the need for health systems strengthening across the continent.

SDG 3 provides African decision-makers with an opportunity to take action on unfinished business to not only achieve SDG 3 but also other interconnected goals. Healthy people lead to a healthy economy, with an estimated 0.4% of economic growth corresponding to a 10% increase in life expectancy at birth (WHO, 2014). Similarly, at a global level, the cumulative economic losses to low- and middle-income countries from non-communicable diseases such as cardiovascular disease, cancer, chronic respiratory disease, and diabetes are estimated to surpass $7 trillion by 2025 (Bloom et al., 2012). By recognizing the interdependence between health and development, the SDGs can be used to improve health factors that contribute to the cycle of poverty.

II. OVERVIEW OF HEALTH IN AFRICA

Africa faces a wide range of diseases that are affecting its social and economic development.

From 2000-2011, HIV-related diseases became the dominant cause of death in Africa (see table opposite). They are especially prominent among adolescents in sub-Saharan Africa, where 22 million people live with HIV and do not

HEALTH

2

GLOBAL DISEASE BURDEN AS A PERCENTAGE OF DISABILITY-ADJUSTED LIFE YEARS (DALYS)

Disease/condition	% of total DALYs
HIV/AIDS	12.4
Lower Respitory infections	11.2
Diarrhoeal disease	8.6
Malaria	8.2
Neonatal infections and other	3.6
Prematurity and low birth weight	3
Tuberculosis	2.9
Road traffic accidents	1.9
Protein-energy malnutrition	1.9

Source: WHO, 2010.

have access to the life-saving antiretroviral therapy that they need (WHO, 2013). Other major causes of death during the 2000-2011 period were diarrheal disease, malaria, pneumonia, meningitis, malnutrition, preterm birth complications, injuries, and violence (WHO, 2013; Salomon et al, 2013; Bhutta et al, 2010). From a global perspective, Africa accounts for over half of the world's cases and deaths of communicable diseases such as HIV/AIDS, malaria and tuberculosis (UNECA, 2015). Additionally, non-communicable diseases, including cancer, cardiovascular disorders and diabetes, are increasing in significance with little investment in the social and environmental determinants contributing to them (Bloom et al, 2012).

On the other hand, under-five mortality rates and maternal deaths decreased significantly from 1990 to 2012: the under-five mortality rate fell from 173 to 95 per 1000 live births; the infant mortality rate dropped from 105 to 63 per 1000 live births, and the maternal mortality rate fell from 960 to 500 per 100,000 live births (Salomon et al, 2013). Sub-Saharan Africa has shown strong progress in reducing under-five mortality rates, as its annual rate of reduction increased from 1.6% in the 1990s to 4.1% in 2000-2015 (UN IGME, 2015). Additionally, several countries have achieved considerable reductions in maternal mortality, specifically Rwanda, Equatorial Guinea, Botswana and Eritrea, where the annual average rates between 1990 and 2010 were 8.7% , 7.9%, 7.5% and 6.3% respectively (Salomon et al, 2013). Although reductions are laudable, Africa remains the region in the world with the highest maternal mortality rate (UNECA, 2015).

III. MAJOR CHALLENGES

The medicines and health interventions needed to address many of the aforementioned problems are well known. Therefore the challenge for African health lies in countries having well-functioning health care systems to deliver interventions effectively. The challenges also lie in sectors outside of the health care system, such as the social and environmental factors that lead to non-communicable diseases, malnutrition, injuries, and mental health disorders. The following section gives an overview of structural challenges that African countries face in successfully achieving SDG3.

2 THEMATIC CHAPTERS

Health financing

Health financing in Africa is characterized by low public investment in health care, a lack of comprehensive health financing policies and strategies, weak financial management systems, inefficient resource use, weak mechanisms for coordinating partner support, extensive out-of-pocket payments, and a lack of social safety nets to protect the poor. During the April 2001 Abuja Declaration, heads of state of the African Union (AU) countries pledged to commit 15 percent of their national budgets to the health sector, spending $44 per capita on health care. As of 2013, only six African countries – Botswana, Madagascar, Rwanda, Togo, and Zambia – had achieved the target (WHO, 2014). This has resulted in high out-of-pocket expenditure for households; in 22 African countries, out-of-pocket expenses made up over 40% of total health expenditure (WHO, 2014).

Access to formal health care

A significant proportion of the African region, particularly in sub-Saharan Africa, has little or no access to the formal health care system. For instance, according to surveys, in 2009 62% of people living in informal settlements and rural areas had little access to health services (WHO, 2014). Another indicator of access to health care is the prevalence of births delivered by a skilled attendant; during the 2007 to 2014 period, professionals oversaw only 51% of births in Africa. Marginalized communities often do not participate in the formal health care system due to a deficit of local services and specialists, inadequate infrastructure and transportation, challenging geography, high financial barriers, and a lack of trust in the formal system (WHO, 2014).

Leadership and governance

SDG 3 calls for increased political will and strong leadership for addressing the systemic issues perpetuating Africa's burden of disease. Improved public health leadership and management will be necessary to effectively and efficiently deliver on services. Challenges include: inadequate health-related legislation and enforcement; limited community participation in planning, management and monitoring of health services; weak cross-sector action to address health determinants; horizontal and vertical inequities in health systems; and under-resourced national health information and research systems (WHO, 2014). Similarly, strong leadership is needed to increase accountability and transparency within health care procurement and supply systems. Comprehensive monitoring and evaluation frameworks and review systems are needed to account for resource use and stakeholder responsibilities (Bhutta et al, 2010). Lastly, African leadership is needed to shape social norms and cultural dialogue around family planning and the use of contraceptives to address high maternal mortality rates and high adolescent birth rates (Sachs, 2015).

Eritrea is one of the few countries that achieved MDG 6, to combat HIV/AIDS, malaria and other diseases. This is due largely to the government's staunch recognition of and commitment to improving and developing an effective needs-based healthcare system. In 1995, there were 300,000–400,000 malaria patients with approximately 500 people dying annually. Additionally, approximately 70% of the population lived in high-risk, endemic areas. The government responded by implementing an array of strategies including national immunization, vaccination and awareness campaigns, and multifaceted community-based programs to employ preventative and control interventions, encouraging early treatment, indoor spraying and using bed nets. In addition, 4,067 Community Health Agents have been trained and deployed since 1999 to appropriately diagnose and treat fevers within the community and to provide education on bed net use, environmental management and early treatment in the community. Their efforts have been proven to effectively control malaria, both in the short and long term. As a result, between 1998 and 2012, malaria-related deaths dropped by over 90% and the annual malaria incidence rate reduced by over 85%. More recently, the government established a Presidential Task Force on malaria elimination, which has developed performance management systems, strengthened malaria diagnosis and treatment measures at health facilities, and expanded logistical capacities at national, zonal, and sub-zonal levels (Wakabi 2007; WHO, 2014; Amahazion, 2013, 2016).

HEALTH

2

An HIV-positive HIV/AIDS counselor in Tanzania who is trained to counsel other men and women with HIV/AIDS.

Research, technology and data

Evidence-based approaches to health care are needed throughout the African region to improve decision-making and accountability, diagnostics, and service design, delivery and management. Information and communications technology (ICT) and internet connectivity remain underdeveloped in the African region, which attributes to weak healthcare systems, as national health management information systems (HMIS) are not able to capitalize on accurate, real-time data for planning and delivery purposes. Additionally, research institutions and diagnostic centers lack the technology and capacity to be fully effective in accurately diagnosing diseases, and generating evidence that can prevent the re-emergence of diseases.

IV. KEY INTERVENTIONS

As previously noted, there is much work to be done to improve the health and well-being of communities throughout African countries. Interventions for SDG 3 will run a wide gamut across sectors and systemic reforms, and will need to be designed with a localized and integrated approach in mind.

Health financing and systems strengthening

Major investments are needed in health, which include not only investing in the health care system but also in related sectors such as water, sanitation, environment, education, women's empowerment, and governance. Approaches to health financing include: conducting a comprehensive health financing needs assessment as part of a larger backcasting exercise for national strategy development; institutionalizing standards around national health accountability and efficiency monitoring to ensure the proper use of resources; strengthening financial management skills through human resource capacity building; allocating at least 15% of the national budget to health development, in accordance with the Abuja Declaration, and implementing the Paris Declaration on aid effectiveness.

Human resources for health

Strengthening human resources for health planning and implementation is essential for SDG 3. Training and education is needed to improve the capacity of health workforces to deliver services, as well as collect and use data. This is seen in the increased use of Community Health Workers (CHWs), who are local community members trained to deliver basic services to under-served rural areas. In addition to this, human resource policies are needed to improve pay systems and retention of health care workers. The leadership and management of health workforces must be equipped to better address the structural challenges of the day through performance-based management systems. As well, regulatory and professional bodies are needed to oversee human resource related activity.

Medical products and technologies

Accountable and reliable medical procurement systems are needed that are transparent and capable of reaching remote communities in need. This will require developing a formula for determining the requirements and forecasting for medicines, commodities, essential technologies and infrastructure, and the creation of a transparent and accountable procurement system.

Health information and research

Health information systems improve the efficiency and accuracy of health care systems, as it helps ensure that resources are effectively directed to where they need to go. Actions that will help this include: developing and implementing a comprehensive HMIS policy and strategic plan; establishing a functional national HMIS by leveraging ICT; developing and retaining a critical mass of human resources for health research; updating national health research policies and strategic frameworks; strengthening research cooperation; establishing mechanisms for scientific and ethical oversight of research, and the acquisition of ICT for research and information.

2 THEMATIC CHAPTERS

EDUCATION

Girls' empowerment class, Uganda.

I. INTRODUCTION

SDG 4 calls for ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. This goal is fundamental to the holistic individual and societal development through learning and empowerment across genders and age groups that will be crucial for sustainable development in Africa.

Taken as a whole, the MDGs have provided a solid foundation for a common global development agenda and made significant progress in advancing human development in the past decade (van Fleet, Watkins, & Greubel, 2011).

In building this solid base, the goal of universal primary education has been, for the most part, interpreted as education inputs related to systems and infrastructure. However, access to education still remains a challenge, especially in Africa, which has the highest out-of-school children rate in the world, accounting for half of the 59 million primary-school-age children out of school in 2010 (UIS, 2013).

One key barrier to school enrollment is school fees. Countries such as Burundi, Ethiopia, Kenya, Tanzania, Rwanda and Uganda have implemented national policies to eliminate school fees. This has resulted in increased primary school enrollment rates. Primary level enrollment in Tanzania doubled to 99.6% in 2008; 7.3 million students enrolled in 2006, compared to 3.1 million in 1996 (Grant, 2009).

Educational challenges affect the most disadvantaged and difficult to reach populations – people who also face

EDUCATION

2

poverty, cultural barriers, conflict and other humanitarian emergencies – and have the keenest impact on girls (Save the Children International, 2013). Twelve million girls (as compared to 7 million boys) in sub-Saharan Africa are never expected to attend school (UNESCO, 2009). To improve education in Africa to achieve SDG 4 will require integrated and holistic steps to improve access, target learning outcomes alongside teacher training, and support empowerment of girls and lifelong learning for all age groups and gender.

II. OVERVIEW OF AFRICA'S EDUCATION LANDSCAPE

The regional consultation and dialogue on the Education 2030 Framework for Action for West and Central Africa points out while Africa has made more rapid progress towards universal primary education since 2000 than during the 1990s, other Education For All (EFA) goals have received insufficient attention (2015). The 2015 EFA Global Monitoring Report states that, of the 18 countries globally that are far from achieving the quantifiable EFA goals, 10 are in West and Central Africa. The SDG frameworks and global efforts to achieve sustainability and development are steps forward to effectively addressing the remaining education challenges and needs.

The Africa region devotes 5% of GDP to public education expenditure and, on average, international donors finance about 6% of the education resources of African countries. UNESCO's recent Education for All Global Monitoring Report (GMR) in 2015 reveals that there is an annual $21 billion external funding gap for achieving quality, universal pre-primary, primary and lower secondary education by 2030. Sachs (2015) raises this gap to $40 billion, which covers universal secondary education with access to ICT. This is especially problematic for sub-Saharan Africa, which accounts for more than half of all out-of-school children but only receives one-third of total education aid. The projected education expenditures by 2030 of 10 low-income countries – Burundi, Central African Republic, Eritrea, DRC, Madagascar, Malawi, Mali, Niger, Somalia, and Uganda – would account for 10% or more of GDP. A small minority of lower middle-income countries will need to roughly double relative spending on basic education to reach the goals by 2030.

The following section outlines the major challenges hindering the education sector's growth and development.

III. MAJOR CHALLENGES

Improving education in Africa will require concrete steps to materialize the efforts that began with MDGs, by investing in classrooms, teacher training and teaching methods, and education for communities, especially for marginalized populations.

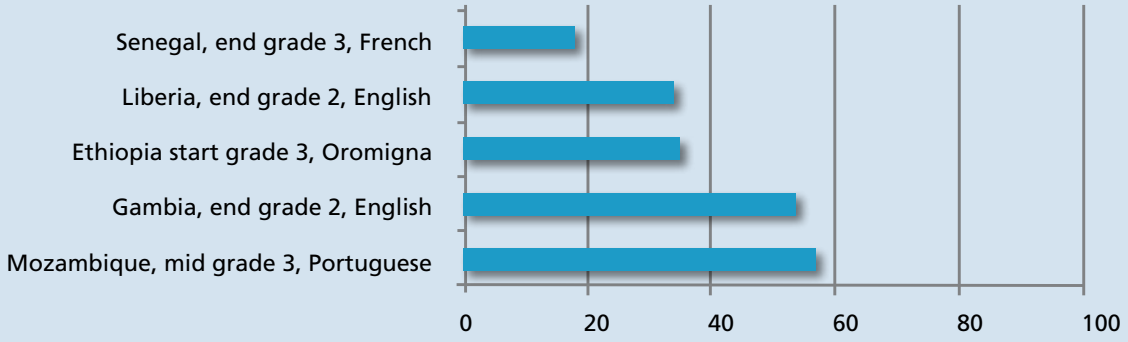
Out-of-school children

Despite the current policy-level global dialogue around the learning crisis, it is widely acknowledged that the original MDG on universal access to primary education is still not a reality for many African children. While there have been significant increases in school enrollment over the past decade, out-of-school figures in the region increased from 29 to 31 million between 2008 and 2010, due to population growth (UIS, 2013).

Some countries in West Africa have made great strides in connecting children to primary education. For example, the primary school enrollment rate in Burkina Faso was one of the lowest in the world in the 1990s because of high school fees, a lack of schools close to rural settlements, and the weak institutional capacity of the Ministry of Education. In response, the government employed a basket-funding scheme to build new schools and renovate existing schools, especially in rural areas. It also supported curriculum development and the capacity and professional development of teachers and the Ministry of Education, and increased teacher recruitment and assignment in rural areas. As a result, the enrollment rate increased to 62% (55% for girls) in 2006, from 42% (36% for girls) in 2000 (Grant, 2009).

2 THEMATIC CHAPTERS

EARLY GRADE READING ASSESSMENTS (EGRA) IN SUB-SAHARAN AFRICA.



Source: Gove & Cvelich, 2010.

Stagnant learning outcomes

Both children in and out of school, who have the potential to quit or return to school, are directly affected by the usefulness of what is being taught in classrooms and how it is being taught. African children now have more opportunity to attend school. However, there continue to be large gaps in learning outcomes, including essential life skills such as reading, writing, and mathematics. Data from Early Grade Reading Assessments (EGRA) in sub-Saharan Africa show serious learning gaps in the lower grades, as shown in Figure 2.

These educational challenges are worse for the marginalized. Children in conflict-affected, rural, and poor areas have the least access to school. They also show the poorest academic performance. Assessments by UWEZO in East Africa show that children from rural and poor areas overwhelmingly underperform on simple tests in Mathematics, English, and Kiswahili compared to their counterparts in urban and relatively affluent areas. The 2012 regional assessment reveals that children who are not poor outperform poor children by 2-to-1 and by 3-to-1 relative to the ultra-poor in Kenya, mainland Tanzania, and Uganda (UWEZO, 2012).

Lack of effective teacher training

The severe shortage of teachers in sub-Saharan Africa has made it difficult for existing teachers to receive proper training and manage the large population of learners. UNESCO estimates that between 1.6 and 4 million additional trained teachers are required in order for sub-Saharan Africa to achieve universal primary education (UNESCO, 2012). The Millennium Villages Project experience has illustrated the essential role that schools and local NGOs play in providing not only pre-service training opportunities but also in-service training for teachers. Traditional campus-based training is simply not enough and courses are often theory-based and lack practice-based quality instruction on effective teaching styles. Although schools and teachers have reported some improvements, there continue to be many challenges in terms of implementation. The lack of a consistent monitoring framework, insufficient visibility of results, a weak financing mechanism, insufficient staffing levels, and an unclear delineation of roles prevent further progress (UNESCO, 2009).

Lack of school readiness

The agenda for early childhood development and education (ECDE) in sub-Saharan African countries is often lost or neglected because of the lack of urgency, sustainable funding, and sensitization to the critical importance of early learning and appropriate care. The lack of provision for young children is especially troubling in African coun-

tries that invest less than 0.1% of their education budget in early childhood and health interventions for children. While global development experts have justifiably emphasized the urgency of child survival efforts, the continuity of healthy child development has been largely abandoned.

Conflict and education

Conflict often leaves a smaller portion of the population with formal schooling, reduces the average years of education, and decreases literacy rates, which remain low over time, according to UNESCO's 2010 analysis of the impact of violent conflict on education outcomes. Furthermore, the negative impacts of conflict on education are long-lasting and exacerbated for marginalized groups, such as women. And Africa carries a heavy burden: of the 25 countries examined by UNESCO, 14 were in sub-Saharan Africa.

Education in emergencies needs to be perceived differently in the light of the massive refugee crises. Refugee camps face many education challenges, including: remote locations; security concerns; language barriers; legal restrictions on movement; poor or nonexistent local infrastructure; inadequate educational materials, especially books; few trained teachers, particularly women, and a lack of resources to address these limitations. Investment in ICT could help to overcome these barriers (FHI 360, 2016).

IV. KEY INTERVENTIONS

Tackling the educational challenges will require carefully planned and considered actions that bring together communities and education systems with policy level dialogue as well as concrete interventions.

Reach the unreachable

The traditional demand and supply solutions encourage on-time school entry and catalyze promotion through the primary school system by building schools, providing flexible schooling hours and systems, and providing micro-enterprise monetary and in-kind support for poor households to increase school retention. But these solutions fail to properly target overage children who never enrolled in school (Sabates, Akyeampong, Westbrook, & Hunt, 2010). Sending them back to regular school is likely to increase their chances of dropping out and the older a child gets, the greater his or her chances are of not completing the basic cycle of primary school (Sabates et al., 2010). There is a need for a parallel non-traditional school structure that could welcome overage adolescents who have enrolled in school, teach them basic literacy and numeracy skills, and prepare them for either the labor force or vocational school.

Further, marginalized populations who are most affected by lack of education access, often girls and women in sub-Saharan Africa context, must receive relevant lessons in empowerment, life skills and opportunities.

Measure learning and share results

Initiatives started by organizations such as UWEZO and ASER, whose mission is to capture and inform children's literacy and numeracy progress, can be expanded throughout Africa. Countries could be required to put in place structures that foster low-cost assessment of children's learning skills at local, regional and national levels. Such efforts could help determine which policy interventions or reforms are needed to improve children's learning. UWEZO's model involves community participation by partnering with local organizations in administering tests and publicizing results on national TV stations and in newspapers. With such visibility, communities are more invested in the learning of children in their immediate locales.

Prioritize school readiness initiatives

Children must be reached before the age of compulsory schooling, during their crucial developmental years. During this time period, there are often inadequate interactions and resources to maximize their development. Linking early childhood programs to primary education is a cost-effective way to ensure timely school enrollment. A proactive approach to improve school-readiness and school attainment is needed. A multi-sector approach, boosting education and health support and awareness at a community level while better informing caregivers and mothers, would maximize children's developmental potential and boost learning skills awareness.

2 THEMATIC CHAPTERS

Mobilizing African Intellectuals Towards
Quality Tertiary Education
5TH - 6TH JULY 2017
KIGALI CONVENTION CENTRE, KIGALI - RWANDA

SDGCIA Conference: Mobilizing African Intellectuals towards Quality Tertiary Education. From Left: Dr. Abdalla Hamdok, Former Executive Secretary (a.i), United Nations Economic Commission for Africa (ECA);Professor Jeffrey D. Sachs, Director, Sustainable Development Solutions Network; His Excellency Paul Kagame, President of the Republic of Rwanda; Dr. Belay Begashaw, Director General, SDGCIA; Honorable Dr. Musafiri Papias Malimba, Minister of Education for Rwanda.

Use technology to improve students' learning and teachers' professional development

One of the major benefits of real time data collection and dissemination via mobile technology is increased awareness of children's learning progress. It enables interventions to be designed to improve the learning outcomes of the actual students who are assessed. Access to clean and quick data enables faster sharing among various stakeholders. Sharing data on student learning allows teachers, community leaders, school administrators, and district government to have a common platform for education discussions. These discussions also generate processes that attempt to resolve issues at the local level and allow teachers to focus their instruction on students' specific need areas.

Innovative educational financing

Public-private partnerships (PPPs) are becoming increasingly prominent in educational financing and, despite the existence of several concerns, form a promising area of educational financing that will be much needed to facilitate improved learning outcomes beyond 2015. Of various case studies around the world, one notes that PPPs are often targeted at schools that are under-served by schools and improve existing education delivery systems. Many cases have shown that such partnerships can lead to better school management and more efficient allocation of resources as well as increased demand for such schools among poor populations (LaRocque, 2008). When the role of private providers, the public standards, and the areas of expertise are well defined and aligned, PPPs can result in effective education provision.

Return to a rights-based approach to education

The SDG principles are universal, transformative, comprehensive and inclusive in nature (UN, 2016). It is crucial to remember that education is a means to protect a basic human right, which develops the best interests of children. This incorporates the inclusion of disabled people through physical, remedial and social support, and the provision of safe learning spaces for the larger community as a whole. These safety measures are not possible when disasters – man-made or natural – affect a community. In order to minimize the impact of disasters on school communities, stakeholders must be engaged, educated, supported, and committed to disaster risk reduction (DRR).

AGRICULTURE, FOOD PRODUCTION AND NUTRITION

2

Mobisol customer briefing in Rural Rwanda.

I. INTRODUCTION

SDG 2 is one of the key priorities of the SDGs, to be achieved through the following targets: end hunger, achieve food security and improved nutrition, and promote sustainable development.

Many countries in Africa are struggling to meet their food needs. They will require technological, environmental and agricultural revolutions to scale up food production systems to meet modern production efficiency. The needs for modernization are most pronounced in commercial and mechanized farming, irrigation and post-harvest handling, value chain and marketing, inputs, and equipment.

In spite of its huge potential in agriculture, Africa has some of the highest importers of foods in the world. West Africa, for example, imports up to 40% of its rice, with Thailand as the main supplier (FAO, 2010). The total volume of cereal imports in Africa was around 66 million tons in 2010 (FAO, 2013a). This means that, across the continent, 30% of all cereals consumed were imported.

Despite domestic production and import efforts, there were 239 million undernourished people living on the African continent in 2012, most of them in sub-Saharan Africa. During the last two decades, the number of undernourished people in Africa has increased by more than 35% (FAO, 2012). This shows that food insecurity has already become an increasingly relevant and pressing concern.

High fertility rates mean Africa is a hotspot for the convergence of rapid population growth and increasing food, fuel and fibre demands. Food targets will only be met by designing strategies to improve domestic food production, increasing food imports, or both. However, with the huge unemployed youth population, which could support sustainable agriculture, food importation should not be an option for Africa.

2 THEMATIC CHAPTERS

Sustainable food security can come through multi-dynamic innovations, technological advances, and integrated research approaches in genomics, irrigation and the management of weather risks to facilitate efficient use of existing land, labor, machinery and other inputs. African food systems and farmers at all levels need to scale up production and productivity. Access to required inputs can achieve this. Inputs should promote sustainable production and the use of high-yield, nutrient-fortified seeds, develop fertilizer use, ensure sufficient access to water, improve post-harvest technology and markets, and enhance value chains.

II. OVERVIEW OF AFRICA'S FOOD SYSTEMS

Hunger and malnutrition persist in Africa for various reasons including unequal access to land and food, and to other productive resources. Sustainable food production is necessary to ensure national nutritional security. Compounding the African food situation is the continent's burgeoning population, which is now estimated at one billion people and projected to reach two billion by the year 2050 (United Nations World Population Prospects 2015). This is expected to lead to a 60% increase in Africa's current food demands. Available records indicate that majority of the African countries' agricultural sectors still provide a relatively large share of GDP – but productivity in the sector has lagged considerably behind that of advanced nations.

On average, agriculture employs 65% of Africa's labor force and accounts for approximately 32% of GDP, reflecting the relatively poor productivity in the sector. While agricultural growth was the precursor to the acceleration of industrial growth in a number of emerging economies such as China, Brazil and India, in sub-Saharan Africa, agricultural productivity remains low and there have been numerous failures in kick-starting it.

Over the past 10 years, sub-Saharan Africa has experienced encouraging economic growth, averaging around 4.5% with some countries averaging more than 8%. Despite this impressive economic performance, agricultural transformation has been slow, agriculture's growth rather sluggish, and poverty pervasive. Notably, productivity is still way below yield potentials, agricultural mechanization is weak and in decline, and the state of the agribusiness industry is still nascent.

III. MAJOR CHALLENGES

For Africa to catch up with its food demands and to end hunger and poor nutrition for its growing population in a sustainable manner, there needs to be a clear understanding of issues related to the following:

Land, water and productivity

About 874 million hectares of Africa's land is considered suitable for agricultural production. Of this, about 83% have serious soil fertility or other limitations and will need improving to achieve high and sustained productivity. Nutrient depletion is common in Africa and represents a significant loss of natural capital valued at an estimated $1-3 billion. The continent is estimated to have about 600 million hectares of uncultivated arable land, roughly 60% of the global total (FAO, 2016). On the remaining relatively useable land, outdated technologies and techniques mean productivity is low. African cereal yields, for example, are just over one-third of the developing world average and have barely increased in 30 years. One major issue is that as much as 80% of Africa's agriculture still depends on rain and not on irrigation. In drier parts of sub-Saharan Africa, productivity is hampered by conflicts between cattle herders and crop farmers.

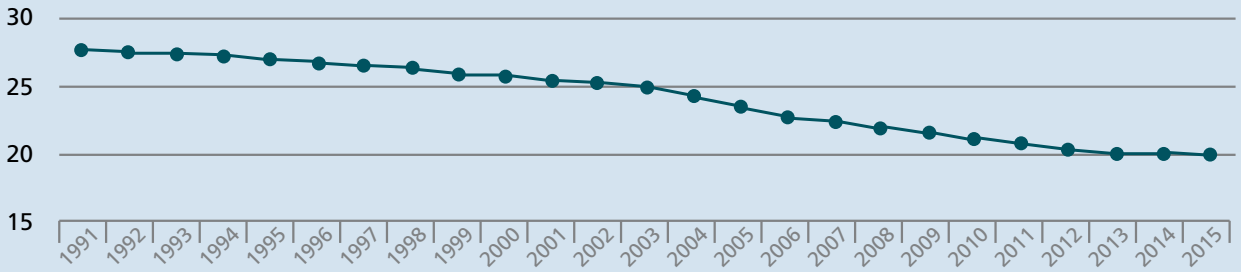
Poverty and malnutrition

The UN Food and Agriculture Organization (FAO) reports show that nearly 239 million people in Africa are hungry, and recent crises in the Horn of Africa and the Sahel certainly highlight the desperate uncertainties of food supply for millions of undernourished populations (UN, 2012). By weakening a child's resistance to disease, malnutrition contributes to child mortality: the WHO estimates that 45% of all child deaths are related to malnutrition (WHO, 2016). The actual number of malnourished children has increased worldwide and 20% of cases are found in Africa (Figure 3).

Although malnutrition affects all ages from the foetal state to adulthood, it is most harmful to children under the age of five. It results in what is known as unachieved human potential, which has implications for the socio-economic development of a nation.

AGRICULTURE, FOOD PRODUCTION AND NUTRITION

PREVALENCE OF UNDERNOURISHMENT % - 3 YEAR AVERAGE, AFRICA



Source: FAOSTAT, 2016.

The major nutritional problems in Africa include: protein energy deficiency; iodine deficiency disorders; vitamin A deficiency; iron deficient anaemia, and being overweight and obese. There are a multitude of factors that influence nutritional status. These factors affect the household economy, as well as economics on a national and international level.

Gender productivity gap

Women play a crucial role in the continent's agricultural sector. They comprise just over 52% of the total population working in the sector and produce up to 60% of the continent's food. However, there is a substantial gender productivity gap that hinders wealth generation, from the household to the national level. This gap is mainly attributed to women's minimal use of productive inputs, due to gender-based social norms and land and monetary constraints. Agricultural output in Africa could be significantly increased by creating greater gender equality in the sector. Research shows that closing this gap will bring production, consumption and poverty gains. Additionally, empowering women to manage plots could result in other positive changes including greater female bargaining power, elevated social status, increases in earning, better child nutrition, and improved health and education outcomes.

Ecological stress, technology and policy

The agricultural production and food supply systems of Africa are frustrated by climatic factors, which include flood, heat, and desertification. There is a low level of technology, and a paucity of inputs and skills among agricultural producers, especially in remote areas with risky or unstable markets, or areas that lack markets entirely. Poor infrastructure also leads to huge post-harvest losses.

IV. KEY INTERVENTIONS

Improved and innovative agricultural practices

For Africa to put its arable lands to proper use, to enhance productivity and supply for its growing population, there is an urgent need for multi-stakeholder participation and smart technology to drive all processes, from tilling to post-harvesting.

Value chains are also critical to improving markets and standardizing trade. Farmers at all levels need to improve their skills and technical expertise in modern food production systems. Farmers need to diversify into multiple enterprises, such as fisheries, livestock, apiculture, snail and mushroom production. And they need to be encouraged with financial support and access to inputs and infrastructure.

2 THEMATIC CHAPTERS

Technology provides limitless possibilities; mobile devices should be deployed to create opportunities for agribusiness, banking, commerce and investment. Mobile technology can accelerate Africa's productivity in farming.

Access to improved seeds

Crop yields can generally be improved by providing high-yield varieties with appropriate inputs and training for the producers. Hence, more research on crop yield in an ever-changing, increasingly warm climate will help to prevent crop failure, crop loss, soil fertility depletion and famine. A sustainable food supply with quality nutrition can be achieved by growing African crops on African soil. Beyond nutritional benefits, it would encourage the growth of Africa-appropriate, indigenous technology, build resilient crop varieties to climate stress and related hazards, and thus strengthen intra-economic development within and between the countries of the continent.

Sustainable irrigation systems

Africa cannot depend on subsistence agriculture to feed its teeming population. There is an urgent need for governments to make a shift from rain-fed food production systems to large-scale, smart irrigation technology to maintain a food supply for its people. Good land is becoming scarce. To keep up with population growth and avoid dependence on commercial imports, farmers have little choice but to intensify production systems to increase yields per unit of land and per hour of labor. Production increases of up to 5% per year are considered viable to increase crop production in dry areas using irrigation development schemes. Irrigated agriculture is particularly appropriate for the production of most staple foods and cash crops.

Sustainable use of fertilizers and agro-inputs

For food production on African soil to give a maximum yield compared to developed nations and leading food producers, harvests need the sustainable use of agro-chemicals to improve, including synthetic, natural and mixed fertilizers, hormones and pesticides. Much of these need to be subsidized by governments and corporate partnerships between and among stakeholders, to boost productivity for efficient food production, supply and preserve the eco-resources.

Improved infrastructure and market systems

Sustainability in food and nutrition for Africans and their prosperity depend on modern and smart facilities to handle post-harvest processes, from the farm to the final households. These include: good roads, post-harvest storing and drying facilities, rail links and local sea ports that are accessible to small-scale farmers and commercial food growers. Power supply at steady and affordable rates will enhance processing by the agro-allied industries, stabilize market prices, improve the quality and value, and reduce wastages. Serious intervention is needed to upgrade product acceptability and agro-trade structure, both within Africa and between Africa and other regions. The introduction of commodity markets with guaranteed minimum prices will serve as an incentive for sustained production, even in times of glut.

One notable intervention is the Agricultural Competitiveness and Diversification Project, implemented by the Ministry of Agriculture of Mali. The 6-year project aimed to "improve the performance of supply chains for a range of non-traditional agriculture, livestock, fisheries, and other products (such as mangoes, cashews, shallots, potatoes, dairy products, beans, papayas, sesame, sheanuts). It would do this by supporting private sector stakeholders (including farmers, traders, processors, exporters, and service providers) to improve farm-level production, technology and productivity of high value crops, supply chains, access to financing, and commercial and communications infrastructure. This has benefited the mango sector tremendously as business practices developed greater professionalism, quality management, compliance to trade standards and increased private investment. In 2008, Mali exported 11,995 tons of mangos, a record amount at the time,

AGRICULTURE, FOOD PRODUCTION AND NUTRITION

2

A woman at the new grain bank in Malawi, a facility that supports the scale-up of farmers' work.

generating approximately 9.7 billion FCFA ($25 million). Mango exports to Europe between 2000 and 2008 increased by 24% per annum (World Bank: Africa Can End Poverty).

Eco-conscious agricultural production

Climate change now threatens food security more than ever and requires the smart adjustment of frameworks, policy, practice, conservation strategies and modern technology. Existing crops must be adapted to the changing climate in order to meet food needs.

Proactive biotechnological tools are invaluable: they can enhance long-term improvement in breeding, developing and promoting adaptive cultivars, encourage climate resilience in the gene pool, and catalyze a move away from over-dependence on land and exposed cultivation systems. The rapid implementation of solutions can mitigate crop failure, yield loss, irreparable eco-degradation from heat, drought, pest infestation, erratic precipitation and nutrient volatilization. Such solutions include harnessing biomarkers for genomic breeding, integrated-trans-technology approaches to nutrient-use enhancement, bio-fortification, and short-cycle farming.

Improved implementation of agricultural programs

Among various programs established for African agricultural development, Comprehensive Africa Agriculture Development Programme (CAADP), under the New Partnership for Africa's Development (NEPAD), sets the framework for regional integration, policy support, and sustainability in technology, food and environment through inter-governmental cooperation among member countries. Although many of these programs face common implementation problems, the improved reviewing and engagement of concerned stakeholders – including rural farmers, NGOs and civil society – can improve the situation. Increased capacity building, awareness, inclusiveness and investment, and better value chains and collaborations, would raise the level of achievements and facilitate qualitative nutrition and agricultural production, productivity and performance over the next decade.

2 THEMATIC CHAPTERS

INFORMATION AND COMMUNICATION TECHNOLOGY

Computer lab in Rwanda.

I. INTRODUCTION

Information and Communication Technology (ICT) is the backbone of sustainable development in Africa. ICT impacts all sectors – such as health, education, infrastructure and agriculture – and has been a major enabler of recent economic success on the continent.

Encompassing a broad range of technologies, ranging from wireless mobile phones to broadband internet to computer and network hardware, ICTs have a wide, catalytic impact across all sectors of economic and social development. For instance, the mobile industry in sub-Saharan Africa reached 367 million mobile subscribers in mid-2015, and is still expected to grow—the current mobile penetration rate of 41% is predicted to increase to 49% by 2020, while mobile broadband connections are to increase from 24% of the connection base today to almost 57%, with a total of 400 million individuals using mobile devices to access internet in 2020 (GSMA 2015).

This ongoing rapid growth in the implementation and dissemination of ICTs across sub-Saharan Africa has led to advances in health, education, and financial inclusion, among others, through innovations such as Mobile Midwife in Ghana and Nigeria, M-Pesa, operating across eight African countries, and more. ICTs thus stand as key development enablers in achieving the SDGs ahead, both through their ability to connect people to needed services across all sectors, and their direct impact on the African and, in particular, the sub-Saharan African economy—in 2014, the total value added generated by the mobile ecosystem

was $43 billion (2.4% of combined GDP), a marker that is only primed to grow in today's wired world (GSMA, 2015).

Despite the ability of ICT to drive sustainable social and economic growth in African countries, however, major challenges remain. Although internet coverage via mobile devices is set to reach 37% of the sub-Saharan African population by 2020, 60% of the population will still lack internet access (GSMA, 2015). Moreover, by 2020, just below half of the population will own a mobile service subscription, far from full mobile coverage.

The connectivity gap is gendered: African women are currently 13% less likely than African men to own mobile phones. The geography of many landlocked countries across the African continent, along with limited and underdeveloped infrastructure, regulatory barriers, and general unaffordability, restricts widespread ICT penetration. Solutions are needed to overcome these impediments.

This section provides an overview of Africa's ICT landscape before delving into a brief analysis of a handful of the countless challenges facing large-scale ICT implementation throughout the continent. It ends with a preliminary outline of key interventions moving forward (GSMA, 2015).

II. OVERVIEW OF AFRICA'S ICT LANDSCAPE

The table below compares the general ICT landscape of 11 African countries with varying population sizes, geographical locations, urban/rural divides, and income levels. For instance, Ghana and Zambia have similar per capita GNI, however Zambia lags behind Ghana in terms of broadband affordability. Burundi and Tunisia have a similar population size, yet 45% more of Tunisia's population is covered compared to Burundi. These comparisons are rough and differences may be attributed to geographical challenges, historical or social issues, and rates of ICT roll-out and adoption. Later in this section, the challenges African countries share to adopt ICTs will be discussed.

2014 ICT LANDSCAPE IN SELECT AFRICAN COUNTRIES

	Nigeria	Ethiopia	South Africa	Kenya	Ghana	Mali	Zambia	Tunisia	Burundi	Libya	Bots-wana	Gabon	Sub-Saharan Africa
Population (millions)	177	97	54	45	27	17	16	11	11	6	2	2	973
Urban population (% of total)	47	19	64	25	53	39	40	67	12	78	57	87	37
GNI per capita World Bank Atlas method	2970	550	6800	1290	1600	660	1680	4210	270	7910	7240	9450	1699
GDP growth (2005-2014) avg. annual %	6.2	10.5	2.5	5.1	7.9	4	7.9	3.6	4.3	-5.8	4.7	3.3	4.5
Telecommunications revenue (% of GDP)	1.6	1.6	4.3	3.4	2.3	7	0.1	3.7	3.5	„	4.1	1.6	3.1
Telecommunications investment (% of revenuel)	75.5	36.2	13.7	20.9	98.7	16.1	...	24.3	...	„	14.4	12.4	26.4
Mobile-cellular telephone subscription (per 100 people)	77.8	31.6	135.8	73.8	114.8	149	67.3	128.5	30.5	161.1	167.3	53.4	71.1
Fixed-broadband subsuiptions (per 100 people)	0	0.5	0	0.2	0.3	0	0	4.4	D	1	1.6	0.1	0.4
Households with Internet access at home (%)	8.5	2.9	„	16.9	29	6.7	6.9	28.8	„	18.1	12.1	2	9.8
Individuals using internet (%)	42.7	2.9	49	43.4	18.9	7	17.3	46.2	1.4	17.8	18.5	4.9	19.2
Fixed-broadband affordability ($ a month)	40.60	21.60	17.10	34.70	33.40	47.80	74.10	6.10	51.40	„	39.00	30.40	40.60

Source: ITU Handbook, 2015.

2 THEMATIC CHAPTERS

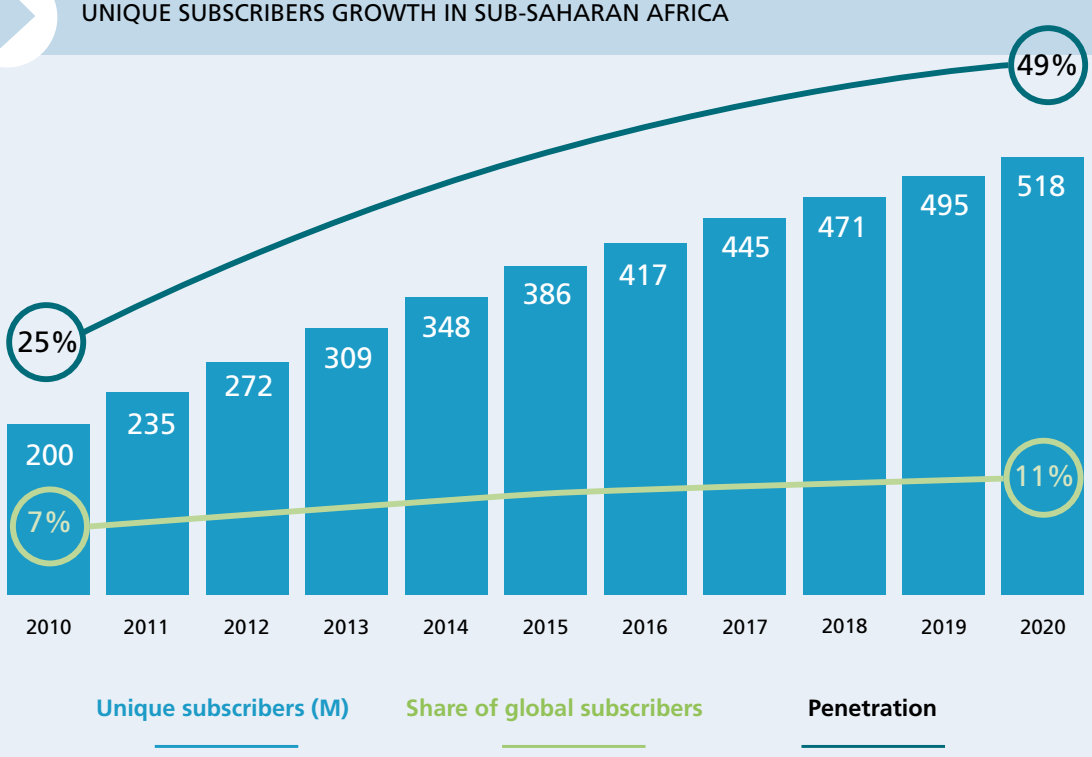
Mobile coverage

As mentioned in the introduction, the mobile penetration rate in sub-Saharan Africa is predicted to increase to 49% by 2020. In analyzing these statistics, however, regional and national differences throughout the continent must be taken into account. By the end of 2014, the mobile penetration rate in East African Countries (EAC) was less than 40%, with national rates ranging from 17% in Burundi to 42% in Kenya. Meanwhile, the mobile penetration rate in Economic Community of Central African States (ECCAS) hit 38% by the end of 2014. Economic Community of West African States (ECOWAS) exhibited a mobile penetration rate higher than the sub-Saharan African regional rate. However, significant country variations exist among ECOWAS states—Niger has 17% penetration versus Mali's 68%. Lastly, the SADC regional block exhibits notably high mobile penetration rates. On average, more than 50% of the population owns a mobile subscription, yet again country variations exist, from a low of 19% in Madagascar to a high of 70% in Mauritius and Botswana (GSMA, 2015).

Broadband connectivity

The current mobile internet penetration of 23% in sub-Saharan Africa is predicted to increase to 37% over the next five years, while broadband connections are to shoot up from 24% of the connection base today up to 57% by 2020

UNIQUE SUBSCRIBERS GROWTH IN SUB-SAHARAN AFRICA

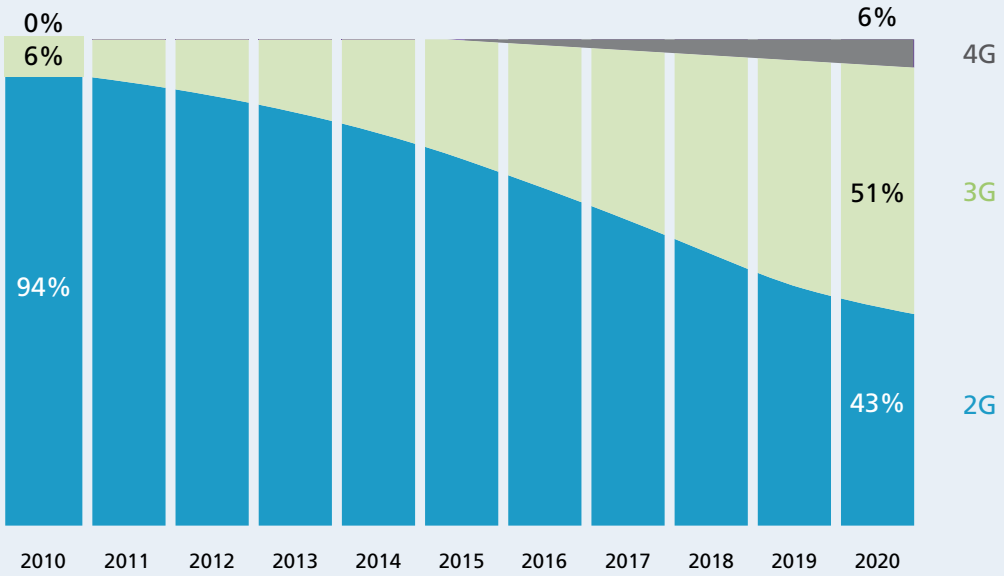


Source: GSMA Intelligence.

throughout the region. This latter statistic is particularly significant: a recent Ericsson study quantifying the impact of broadband found that a doubling in broadband speed increases GDP by 0.3% (Broadband Commission, 2013). Indeed, as of June 2015, commercial 3G networks have been launched in 41 countries across sub-Saharan Africa, and 4G networks in 23 countries. Among the sub-regional groupings, all five EAC member countries boast 3G services and four of the five have 4G services; the region is seeing a rapid transition to mobile broadband as the proportion of 2G connections decreases and is replaced by higher-speed networks. ECCAS has exhibited a slower transition to mobile broadband, with 2G currently serving 90% of total connections, and 3G and 4G launched in only four of the ten member countries thus far (3G in Congo Republic, and 4G in Angola, Cameroon and Gabon). ECOWAS is in a similar stage with 2G accounting for 90% of total connections, though 3G adoption is gaining momentum; it is predicted that around 40% of the connections in the sub-region will be 3G by 2020, though predictions of 4G adoption rates remain quite low due to challenges of spectrum availability. Lastly, the transition toward high-speed networks in SADC is notable. Mobile broadband now serves 25% of all connections, a figure that is set to rise to 67% by 2020, as 4G adoption grows significantly over the next five years (GSMA, 2015).

AFRICA: TECHNOLOGY SHIFT ONGOING

Percentage of connections



Source: GSMA Intelligence.

2 THEMATIC CHAPTERS

Smartphone adoption

With 160 million smartphones in use in 2015, the sub-Saharan African mobile economy is expected to add about 400 million new smartphone connections by 2020. The smartphone installed base will thus total over half a billion by the end of the next five years, as device prices continue to fall and smartphone implementation grows as a result. Sub-regionally, the smartphone adoption rate in EAC was 11% in 2014, yet is set to reach more than an impressive 50% by 2020, totaling 86 million connections by then. ECCAS is predicted to exhibit similar growth in smartphone adoption: 15% in 2014 is predicted to grow to 54% by 2020, with a total of 80 million connections. As for ECOWAS, smartphones accounted for nearly 20% of connections by the end of 2014, and are set to reach 50% by 2020 with a total of 227 million connections across the sub-region. Finally, SADC exhibits the highest current smartphone adoption rate in the region at 25%. That adoption rate expected to increase to 60% by 2020, with 198 million smartphones in use (GSMA, 2015).

III. MAJOR CHALLENGES

Despite significant progress, many African countries still face major challenges in connecting their populations and fully reaping the economic and social benefits that accompany a country's participation in the information age.

Geographical challenges

The diverse and difficult geographic terrain of many African countries is often cited as a key barrier to accessing ICT-driven financial, health, and educational services. It therefore also serves a reason for a stagnant economy. In the past few years, fiber-optic cables running along ocean floors have helped connect many coastal countries in Africa, such as South Africa. However, for most of sub-Saharan Africa, delivery of the energy necessary to power ICT services is challenging and costly. Diesel-based energy, lack of infrastructure, transport costs, and lax regulatory environments create costly structures for ICT operators and thus deter the spread of ICT operations at large. This explains the slow adoption of broadband technologies in many sub-Saharan African countries, as they require consistent energy bases and viable infrastructure investments.

Rural connectivity

Though many urbanized areas of Africa have witnessed booms in mobile and internet usage in the past decade, a key challenge for the upcoming decade is the bridging of the disparate urban/rural divide in access to mobile, internet, and other ICT services. Low Average Revenue Per User (ARPU) levels and high illiteracy in rural consumers are not viewed favorably when a country is weighing the high costs of network deployment and maintenance in remote communities (GSMA, 2015).

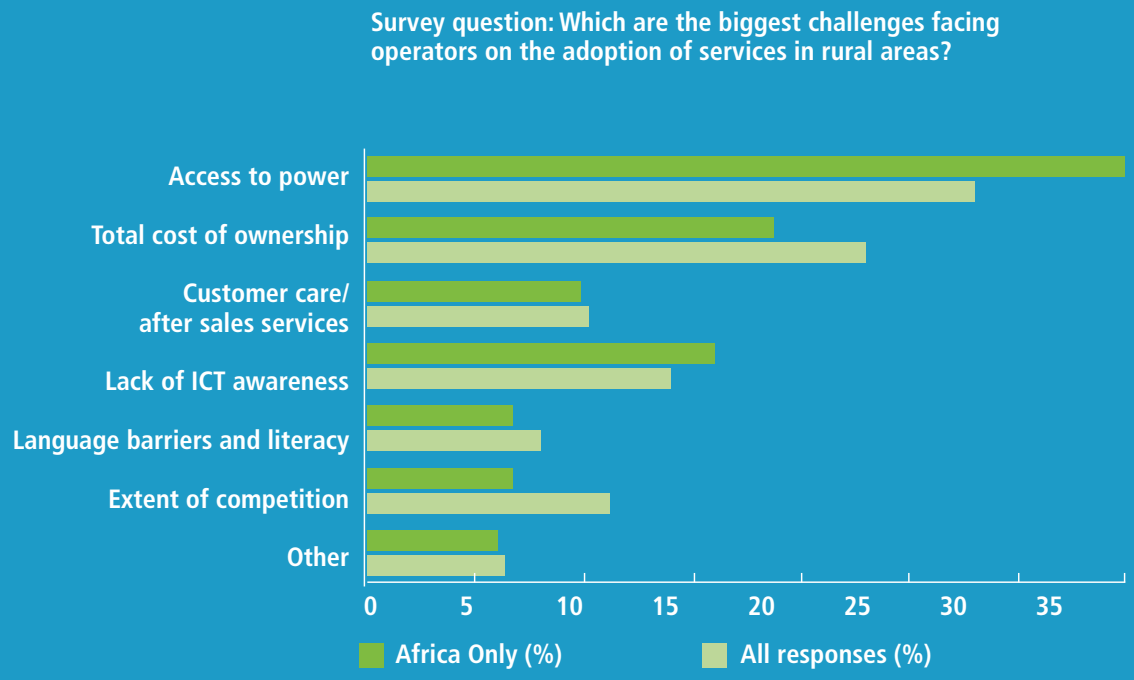
From the rural consumer perspective, the low adoption is generally attributed to (i) unreliable access to power, (ii) high total cost of ownership, and (iii) lack of ICT awareness and thus appreciation for its uses.

The table to the right, provided by Informa Telecoms & Media, illustrates a survey tracking the main issues behind adoption of ICT services in rural areas.

Regulatory environment

Government corruption, unattractive investment systems, and dysfunctional regulatory frameworks remain large-scale policy challenges to ICT implementation and, subsequently, economic development. National ICT policies have been woefully under-utilized in most African countries, and there are disconnects between urban and rural ICT policies, where generally only urban areas are tended to with telecommunications services. Moreover, regulation of telecommunications markets is vital, as monopolies or duopolies (such as the current duopoly in Mozambique) often stifle the competition necessary to maintain the quality of services.

BIGGEST CHALLENGES OF ICT ADOPTION IN RURAL AREAS



IV. KEY INTERVENTIONS

Though there are many challenges for African countries and companies to tackle in the next decade, they are certainly not insurmountable. The past decade saw enormous enthusiasm for mobile technologies from a developing African consumer base. Interventions such as M-Pesa and Ushahidi were rolled out in a large-scale, innovative, and cost-effective manner, which awakened the consumer interest and jump-started the technological revolution in Africa.

By adjusting its policies to favor a friendly legislative environment for tech startups, specifically around the banking and telecom sectors, Kenya transformed Nairobi into a globally-recognized hub for technology and innovation. Tech giants such as Cisco Systems, Intel, IBM, Facebook, Google, Nokia and Microsoft established hubs in the capital and are now expanding their business operations, proving the effectiveness of government support.

Solutions to geographical challenges

The remote terrain of African countries may be costly to navigate, yet there are many solutions to bypass the issues caused by geographical barriers. The dependence on diesel-operated remote bases for mobile operations will be neither feasible nor cost-effective in the long run. The urgent need for alternative energy in the current climate change crisis has created many innovative and alternative energy access projects, which African leaders must push to adopt.

A switch to alternative energies such as solar and wind energy will help reduce transport and infrastructure costs, and will thus allow for broadband technology access in

remote areas. Further, businesses should collaborate with governments and international companies to promote the best financial and cost modeling in order to reach unconnected customers. An example of a partnership solution occurred when a telecom tower company, Eaton Towers, took over the management of Vodafone Ghana's 750 telecoms towers, promising to invest up to $80 million in improvements, build new towers, and reduce reliance on diesel power.

Solutions for unconnected populations

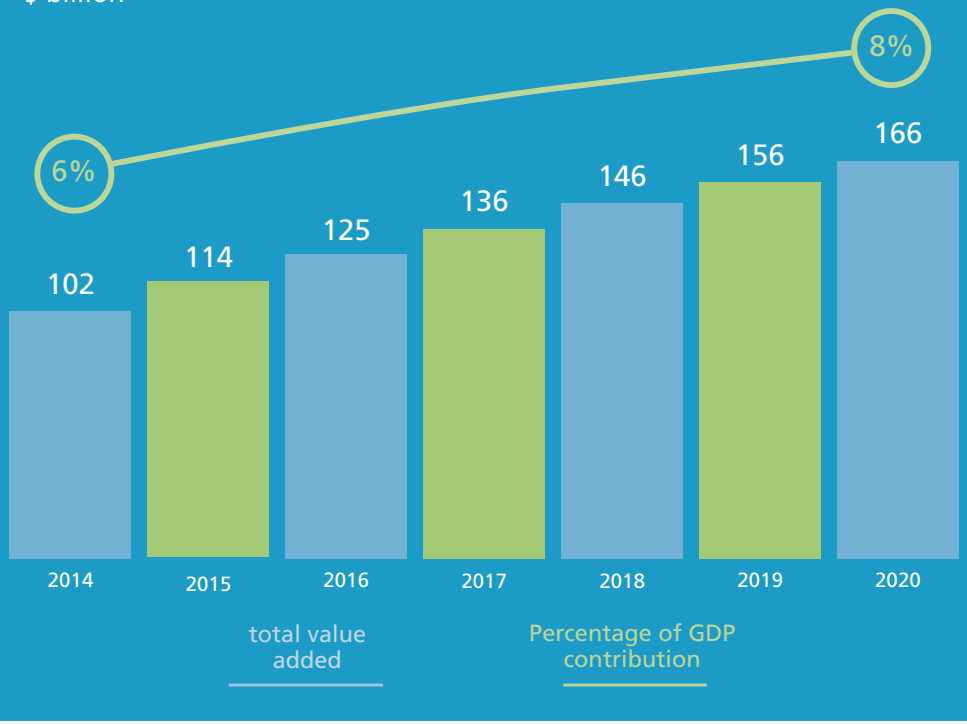
In order to connect the unconnected (particularly in rural areas), a rapid rollout of ICT is necessary. This will require national ICT policies with established timelines. Universal broadband connectivity of public facilities and public services, for instance, should be established no later than 2020 to achieve the SDGs by the target date of 2030 (Ericsson & SDSN, 2015).

The economic contributions of the mobile industry as a percentage of GDP in sub-Saharan Africa is predicted to grow significantly to more than $160 billion by 2020, as demonstrated in the graph below.

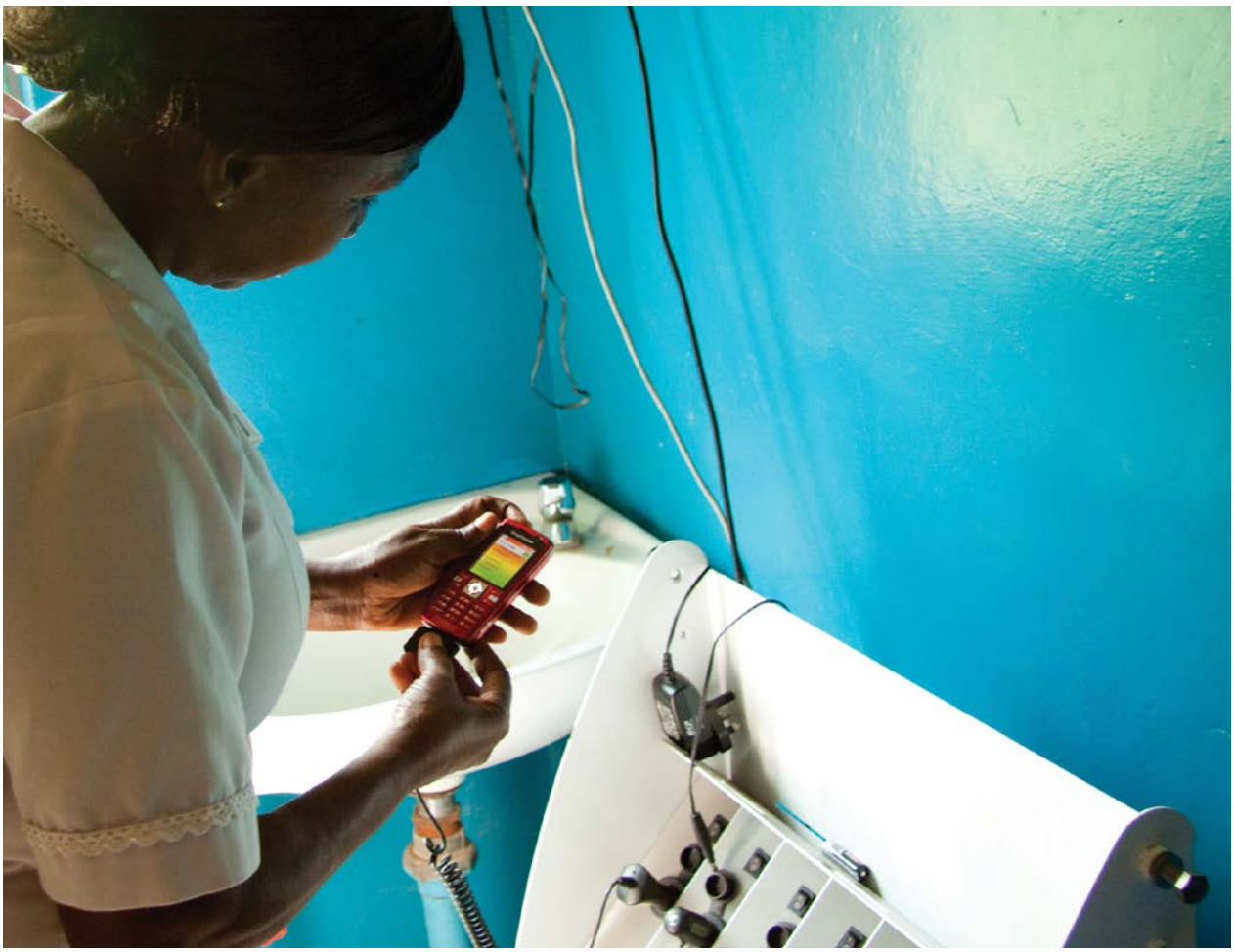
Solutions to lax regulatory environments

Reformed regulatory environments, such as laws protecting intellectual property rights, open/transparent licensing, and incentives for entrepreneurial local businesses and wired solutions, should be institutionalized (Ericsson & SDSN, 2015). These changes will help promote competition in the telecommunications industry, incentivize innovation, and spark the endogenous growth necessary for long-term sustainable development. Kenya continues to provide an example to follow with the favorable environment it created in Nairobi for its 'Silicon Savannah,' which has been the leader in ICT innovations that catalyze development, such as M-Pesa (mobile money) and Ushahidi (crowdsourcing).

Economic contribution of the mobile industry in sub-Saharan Africa
$ billion



Source: GSMA Intelligence.



Woman charging cell phone in Ghana.

Recognizing the cross-cutting benefits of ICT

Additionally, entrepreneurs and leaders must recognize the power of mobile networks for services beyond just voice and internet access. More than one-fifth of mobile connections in sub-Saharan Africa were linked to a mobile money account by the end of 2014 (GSMA, 2015), and it helped facilitate individual and business transactions parallel to the functions of a traditional banking industry.

Aside from banking, mobile technologies are being used for a wide variety of purposes, from tracking epidemics to communicating agricultural information. The reach of smartphones will allow farmers to have access to the internet and applications such as Esoko, which provides important agricultural data to citizens within the agricultural and trade sectors.

In addition to mobile-based technologies technological advances involving biometrics (fingerprints and retina scans) such as Aadhaar can benefit African governments and citizens, where formal identification cards and documents are frequently nonexistent. Such technologies aim to streamline service delivery, to reduce fraud and waste, and to facilitate efficiency when using tools and services such as mobile money transfers, cloud-based identification, applications and appointments, and electronic medical records.

2 THEMATIC CHAPTERS

ENERGY AND INFRASTRUCTURE

A pastoralist from Kenya and his family who are benefiting from innovations like ICT, water and energy access.

I. INTRODUCTION

SDG 7 calls for sustainable energy access for all and SDG 9 for the development of resilient infrastructure. These goals are critical for sustainable development in Africa.

Insufficient infrastructure and energy supply/provision remain a major impediment across the continent. Continuous power cuts characterize the energy sector throughout. Transportation is costly and unreliable, with only a quarter of African roads paved. The Internet penetration rate is approximately 10%, and water management is deficient, with only 5% of agriculture under irrigation.

Within the broader category of infrastructure, energy provision and access remains an especially acute challenge. Despite being home to approximately 15% of the world population, Africa only accounts for 4% of the global energy demand. More than 600 million people do not have access to electricity and over 700 million people rely on biomass for cooking, leading to significant health challenges and pronounced deforestation (IEA Africa Energy Outlook, 2014). The lack of energy access slows down potential economic growth by a minimum of 2.1% of GDP per year, in all likelihood a lot more (World Bank).

The African energy sector is complex and heterogeneous, with significant regional variations. For example, less than 1% of the population of North Africa lives without

electricity, compared to over 40% in Central Africa. Nigeria is rich in oil and gas reserves, whereas South Africa has significant coal deposits, which make up 70% of its electricity generation. The significant regional variations in resources, regulations and investment climates underscore the need for national and regional solutions.

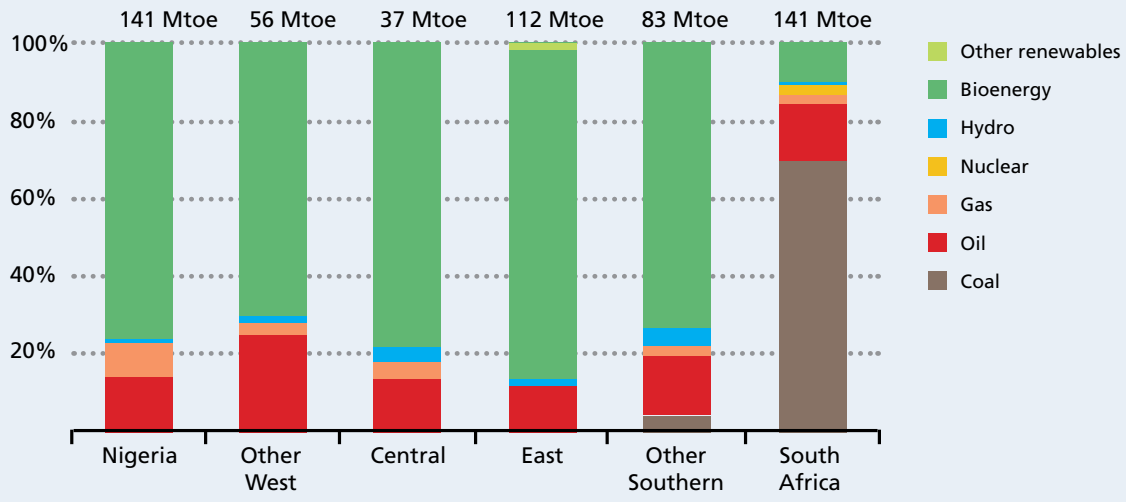
To achieve SDGs 7 and 9, Africa will require a significant acceleration in investment, regulatory focus and regional coordination, to build energy systems that will support broad-based sustainable development. This section provides an overview of Africa's energy landscape, an analysis of a few of the many challenges facing this sector, and an outline of key focus areas moving forward.

II. OVERVIEW OF AFRICA'S ENERGY LANDSCAPE

In 2012, primary energy demand for Africa was 739 million tonnes of oil equivalent (MToe), an increase of approximately 50% from 2000. During this period from 2000, the energy intensity of the sub-Saharan economy reduced by 2.5% per year, but is still more than double the world average. Nigeria and South Africa account for more than 40% of total demand, though only 25% of the region's population. The energy use-per-capita remains one-third of the world average of 2.1 tonnes of oil equivalent per capita, and one half of the level of developing Asia, which is the world's second poorest energy region (IEA, 2012).

The primary-energy mix of sub-Saharan Africa has significant regional variation, as seen in the chart below. However, one constant throughout is bio-energy, which accounts for more than 60% of total energy use. Since 2000, the increase in demand for bio-energy has been larger than the increase of all other fuels put together. Coal is the second largest component of the energy mix, due solely to South Africa, where coal accounts for over 70% of primary demand. Oil demand makes up 15% of total energy demand, where modern renewables – hydro, wind, solar and geothermal – currently account for less than 2% of the energy mix (IEA, 2012).

SUB-SAHARAN AFRICA PRIMARY ENERGY MIX BY SUB-REGION, 2012



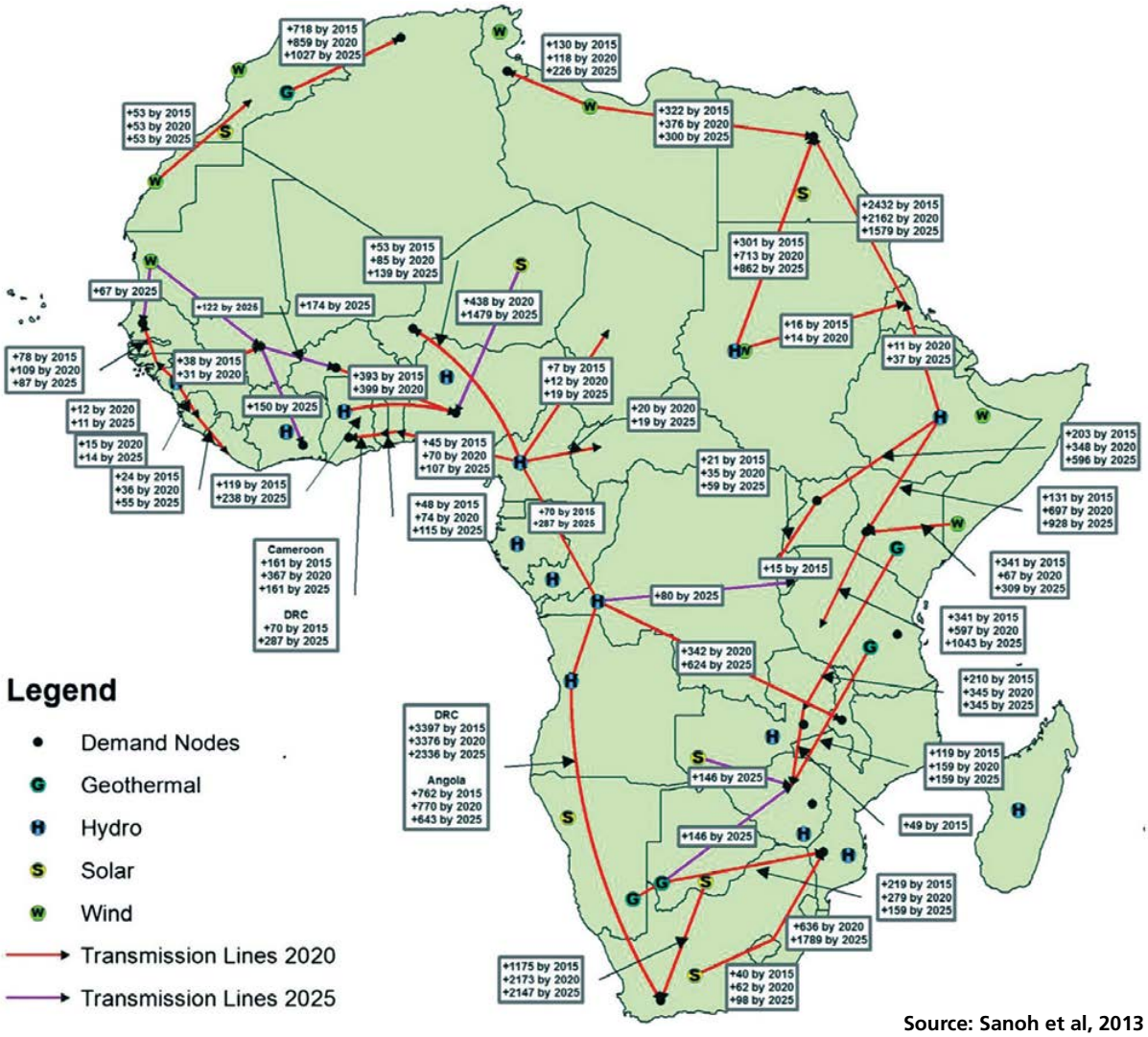
Source: Africa Energy Outlook, OECD/IEA, 2014.

2 THEMATIC CHAPTERS

The energy resources in Africa are more than adequate to meet the continent's needs. At the current level of production, the remaining recoverable resources of oil are sufficient for 100 years, coal for more than 400 years and gas for more than 600 years. The renewables opportunity is arguably even more compelling: according to some estimates, Africa could quadruple its renewable energy usage in the next fifteen years. Currently, hydropower only accounts for 20% of the region's power, but according to the IEA, this is only 10% of the technically feasible level of output.

A recent continental-wide study of African energy infrastructure highlights the possibilities of hydro, wind and fossil fuel energy potential on the continent (Sanoh et al, 2013). The study analyzes the optimal options for supplying electricity to national economies, from both domestic and distant energy resources, using high voltage lines to transmit Africa's substantial renewable energy resources. To meet the growing demand, Africa will need to provide 5.2 GW of new generation per year until 2025. This figure represents an increase of 65% from the 2010 level and will assist in connecting more than 11 million new customers per year through the development of a transmission network. On a regional basis, natural gas can play a significant role in East Africa, hydropower in Central Africa, and solar in Northern Africa.

AFRICAN ENERGY INFRASTRUCTURE



Source: Sanoh et al, 2013

ENERGY AND INFRASTRUCTURE

2

III. MAJOR CHALLENGES

Building an energy system for Africa that meets the continent's growing energy demands is a multi-faceted challenge. It includes addressing energy poverty increasingly concentrated in rural areas, shifting energy demand away from biomass, transforming transportation and energy infrastructure, and accelerating regulatory reform.

An overarching challenge is the lack of sufficient investment in energy and infrastructure development and maintenance on the continent.

Energy poverty

Energy poverty remains one of the most significant bottlenecks for broad-based sustainable development. In 2012, approximately 50% of the global population who did not have access to electricity lived in Africa. The IEA projects that by 2040, one billion additional people will gain access to electricity, 950 million of whom will be in sub-Saharan Africa. However, given population growth in the region, over 600 million people are projected to remain without electricity by this date, and 90% of them will live in rural areas.

Impact of biomass and deforestation

Solid biomass is the largest source of energy for sub-Saharan Africa, comprising 70% of the region's total energy consumption. This energy is used overwhelmingly (90%) by households – mostly in the form of fuel wood, straw, charcoal or dried animal/human waste – as a source for cooking fuel. There are two significant challenges that arise from biomass as an energy source: health impacts, and deforestation. Each year, approximately 600,000 people in Africa die prematurely due to household air pollution, mainly from the use of solid fuels such as wood and charcoal. In addition, Africa's rate of deforestation is twice as high as the rest of the world, due in large part due to the surging demand for wood and timber as fuel.

Lack of infrastructure

The lack of broad-based transportation and energy infrastructure remains a critical challenge for Africa. Given its large geographical expanse, low population density and 54 sovereign countries, developing national and regional infrastructure is a major challenge. Mass transport is rare and poorly maintained. As a result, energy use in transport is heavily concentrated on vehicles, but due to low road density (89 km per 1000 km^2 area), there is little demand for transport services. In energy infrastructure, most African nations have poor and incomplete energy grids, transmission systems and refinery processes, leading to inefficiencies such as gas flaring.

IV. KEY INTERVENTIONS

Africa needs a continent-wide strategy to accelerate progress towards SDGs 7 and 9. This will require a cross-sector approach to energy, infrastructure development and technological diffusion throughout the continent.

Major scale-up of investment in energy supply, transmission and infrastructure

Since 2000, investment in sub-Saharan energy supply has doubled from approximately $30 billion to $65 billion, $50 billion of which is for oil exploration. However, to achieve universal access, Africa requires a major scale-up of investments in oil as well as non-oil sources of approximately $100-$150 billion per year. These investments need to be tied to a continent-wide energy plan that takes into account local supply/demand dynamics, infrastructure requirements, environmental constraints and investment flows.

2 THEMATIC CHAPTERS

Rooftop solar panel in Ghana.

Improved management of natural resources

African governments must improve the management of natural resources for energy development. Most importantly, the development of natural resources must ensure broad-based social and economic benefits for the entire population of the country. This requires clear policy frameworks, regulation, and assurance of tax receipt, and participation of local companies in the supply chain. For renewable energy resources, there must be creation and adherence to policies around land use, forest management and sustainable production, to ensure environment sustainability alongside economic growth.

Strategic focus on natural gas and renewables

Natural gas and renewable energy provide two critical opportunities for acceleration in energy access and delivery. Despite significant promise, natural gas makes up a small percentage (4%) of the energy mix in sub-Saharan Africa. The recent gas discoveries off the coast of Mozambique and Tanzania provide the opportunity to create natural gas based infrastructure in the region, if proper transportation and power infrastructure is created. Similarly, renewable sources – particularly solar, wind and hydro – provide enormous opportunity for base-load power generation as well de-centralized, off-grid energy access solutions.

Deeper regional coordination

Given the geography of Africa, with many land-locked countries and the uneven dispersion of natural resource wealth, regional cooperation is necessary for energy and infrastructure goals to be met. Many regional initiatives – such as the Programme for Infrastructure Development in Africa – are underway to develop cross-border energy and transportation infrastructure. These initiatives need to be supported by governments as well as international financial institutions to accelerate progress.

Country level regulatory reform

Countries must continue to make the required regulatory reforms of energy and infrastructure sectors. Reforms are needed to strengthen governance of nascent energy markets, ensure transparency and protection of contracts and property rights, and to open up investment opportunities for global public and private investment. There is no single solution for energy market governance and reform.

2

JOBS

I. INTRODUCTION

SDG 8 calls for the promotion of sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. African nations will need to address a host of issues if they are to achieve SDG 8, which is intricately linked with the rest of the sustainable development agenda.

Between 1970 and 2010, sub-Saharan Africa's working age population grew from 92 million to 466 million. The ILO projects that by 2030 sub-Saharan Africa's working age population will grow to 793 million, a 70% increase from current levels. To achieve this level of job-creation, African nations will need to diversify industries, foster entrepreneurship and higher levels of economic productivity, upgrade technologies, and devise and implement holistic job-creation strategies that tackle challenges in education, infrastructure, job training, agricultural productivity-enhancement and other related issues.

II. OVERVIEW OF AFRICA'S EMPLOYMENT LANDSCAPE

The African continent has a highly complex employment picture, with significant variations based on the geography and economic structure of each country. The overview data for both North Africa and sub-Saharan Africa is below (ILO).

OVERVIEW OF AFRICA'S EMPLOYMENT LANDSCAPE

Labor market outlook for Northern Africa (2000–17)

	2000–07	2008–13	2014	2015	2016	2017
Labor force participation rate	47.4	47.7	48.0	48.2	48.3	48.3
Unemployment rate	13.4	11.4	12.5	12.1	11.8	11.6
Employment growth	2.9	1.9	1.5	2.5	2.1	2.2
Vulnerable employment	36.7	33.7	34.2	34.0	34.8	34.6
Working poverty (less than US$1.90)	8.6	6.0	5.2	5.2	5.3	5.2
Working poverty (between US$1.90 and US$3.10)	26.4	20.5	19.0	18.8	18.6	18.2
Productivity growth	1.9	0.8	-0.4	1.1	1.8	12.1

Labor market outlook for sub-Saharan Africa (2000–17)

	2000–07	2008–13	2014	2015	2016	2017
Labor force participation rate	69.8	69.9	70.0	70.2	70.3	70.4
Unemployment rate	8.1	7.6	7.3	7.4	7.5	7.5
Employment growth	3.0	3.0	3.4	3.0	3.0	3.1
Vulnerable employment	72.9	71.4	69.8	69.9	69.7	69.6
Working poverty (less than US$1.90)	49.3	39.9	35.2	34.3	33.1	31.7
Working poverty (between US$1.90 and US$3.10)	26.4	27.7	29.6	29.7	30.0	30.4
Productivity growth	2.9	1.8	1.5	0.5	1.2	1.7

Data source: World Bank.

There are a few important observations from this high level data. Firstly, the relatively low unemployment rates in the official data do not accurately reflect the employment status for many Africans. This is because a significant portion of African labor, ranging in estimates from 50% to 80%, are outside the formal labor market and therefore do not appear in the official statistics.

Secondly, approximately 70% of the total population works in the agricultural sector, which remains the overwhelming source of employment and contributor to economic output for the continent. Due to stalling level of agricultural productivity and a poor record in industrialization, agriculture will remain a significant employer in Africa and must be examined closely as part of any solution for job growth.

Landlocked Lesotho leveraged the African Growth and Opportunity Act (which grants certain African exports duty-free access to the US) to expand its industrial sector. Lesotho developed industrial zones, building rail links between them, offered incentives to foreign investors, and simplified regulations. This substantially increased Lesotho's exports and made the sector the largest generator of jobs in the country, employing around 40,000 people in a country of just two million.

Finally, the percentage of workers in vulnerable employment in sub-Saharan Africa is very high, and remains stubbornly so in forecasts. This is a major policy challenge. From 2002-2012, Africa's labor force expanded by 91 million people, yet only 37 million of the new entrants were in wage-paying jobs (McKinsey, 2012). The rest found themselves either unemployed or in subsistence work. The creation of stable employment is a necessary ingredient, and outcome, of sustainable development.

III. CHALLENGES

Lack of agricultural productivity

The productivity of African agriculture is much lower than other regions in the world. The African Development Bank estimates that per capita agricultural output in Africa is 56% of the world average. 80% of output growth since 1980 has been due to the expansion of cropped areas rather than greater productivity. Poor agricultural productivity means that a larger percentage of employment must stay in the sector and not be upgraded for manufacturing and, ultimately, service jobs. Solving the employment challenge in Africa will require improving the agricultural systems.

Decline in manufacturing

Africa as a continent has not been successful in its various attempts to industrialize. The absence of a structural transformation has been problematic in creating higher wage jobs to absorb the growing working-age population. On average, Africa's industrial sector today is smaller, as a percentage of total economic output, than it was thirty years ago. This "deindustrialization" has happened along three important metrics: size, diversity and sophistication. It must be reversed if African nations are to achieve the SDGs (Page, 2012).

Employment vulnerability, particularly for youth

Youth unemployment remains a particular challenge for Africa, both North and sub-Saharan. Given the demographic challenges and opportunities stated in an earlier sector, Africa will experience a significant "demographic dividend" as fertility rates decline. However, this dividend must be properly directly towards stable employment in growing sectors such as retail, tourism, hospitality, and information technology. Africa will not be able to achieve the SDGs if the working-age youth remain primarily in vulnerable employment.

Knitting cooperative in Rwanda.

Job skills and training

African nations will need to develop training programs for the jobs of the future, which will likely be related to the information technology sector and those that it services. Given the accelerating forces of mechanization and automation, universities and institutions of higher learning will be particularly important for the continent. However, Africa today has only 2 out of the top 100 universities in the world, despite being 15% of the world's population.

IV. KEY INTERVENTIONS

Major increase in education and vocational training

African nations need a massive scale-up of education resources and improvements in outcomes at all levels. Globally, there is an estimated annual financing gap of $38 billion in education for the SDGs, with a considerable portion of it in Africa (UNESCO, 2015).

Increased investments in infrastructure and agricultural productivity

Investments in transport, energy and information technology infrastructure remain critical to improve employment in Africa. Africa needs an annual increase of $50-70 billion in infrastructure investments to promote economic growth and industrialization.

New forms of financing for small and medium enterprises

There remains a significant shortage of capital for African businesses. A recent estimate by the Omidyar network estimates that Africa suffers from a $140-170 billion credit-financing gap. This is highly problematic for small businesses that are seeking capital to grow their operations and increase employment of local labor to do so. New forms of financial intermediation will need to be developed to fill this gap.

Reduction in macro-economic volatility and political uncertainty

High levels of volatility in economies and governments have historically been a major source of uncertainty for businesses that want to invest in Africa. African nations must undergo economic and political reform to diversify their economies (thereby lessening the frequency of shocks) and strengthen political institutions to give businesses the confidence to invest.

2 THEMATIC CHAPTERS

DEMOGRAPHY

Camels hold business potential for dryland communities.

I. INTRODUCTION

The challenges of achieving the SDGs in Africa are intimately linked to the continent's demographic trends. Although demography is not a goal in and of itself, it is cross-sectoral: the variables associated with demography span multiple SDGs.

While statistics vary within and across the continent, Africa is the only region in the world that has yet to experience a demographic transition. It has the highest population growth rate in the world at 2.55% annually, and is expected to remain at the top of the rankings due to high fertility and mortality rates. Of the 2.4 billion people anticipated to join the global population by 2050, over half will be in Africa. To demonstrate this, from 1950 to 2015 alone, the population grew five-fold, from 179 million to 950 million (UNDESA, 2015). The demographic direction Africa takes in the coming decades has clear implications for the sustainable development of the region.

The demographic transitions that took place in East Asia and Latin America offer insight for Africa in achieving the SDGs. Their experiences show that, with proper policy interventions, Africa can experience a demographic dividend in which reductions in child mortality and fertility lead to economic productivity that benefits SDG 3, health; SDG 4, education; SDG 8, job creation; and SDG 5, gender equality.

Urbanization must also be a priority. According to the African Economic Outlook (2016), two-thirds of the African population is expected to live in cities by 2050. The way in which Africa urbanizes will therefore determine the

DEMOGRAPHY

2

region's future growth and development. Between 1995 and 2015, the urban population in Africa doubled. This structural transformation can be leveraged for positive change provided urban proper planning is put in place. This will include increasing infrastructure investment, matching real estate markets with the housing demand by clarifying land rights; managing the growth of intermediary cities; and improving the provision of infrastructure and services within and between cities.

The demographic transition theory states that, as fertility declines, the number of young dependents also declines, which increases the ratio of working-age people to dependents. Once the fertility rate falls to a replacement level of 2.5 workers per dependent, the change in labor supply spurs economic growth (WBO, 2015). If the 'bulge' generation has a healthy job market and financial system to participate in, a second dividend comes from families being able to invest more in their children's health and education due to smaller family sizes, as well as be able to save for retirement and invest.

The interconnected effect of these changes highlights the importance of taking demography into account when designing policies for the SDGs. Adversely, if demographic trends are not considered, the influx of working-age people can result in widespread unemployment and underemployment that can lead to political instability, civil unrest and crime, along with exacerbated poverty and food insecurity.

This section provides a general overview of demographic trends in Africa, major challenges, and key interventions. With Africa's projected share of the world's population estimated to rise from 17% in 2010 to 39% by 2100 (UNDESA, 2015), African policy-makers have an opportunity to not only shape the likelihood of this occurrence but also to steer the way in which this change is used for achieving the SDGs.

II. OVERVIEW OF AFRICA'S DEMOGRAPHIC TRENDS

Africa's demographic trends vary across regions, rural and urban areas, and socioeconomic quintiles, with northern and southern Africa leading the demographic transition. On the contrary, the remaining regions have yet to transition, with most population growth in the upcoming 50 years projected to take place in sub-Saharan Africa (WBO, 2015). Although the growth rate of sub-Saharan Africa has slowed, it remains comparatively high, with population density expected to nearly triple. The populations of 33 countries are likely to triple between 2015 and 2011. Among them, the population of ten sub-Saharan African nations are expected to increase five-fold by 2100 (UNDESA, 2015).

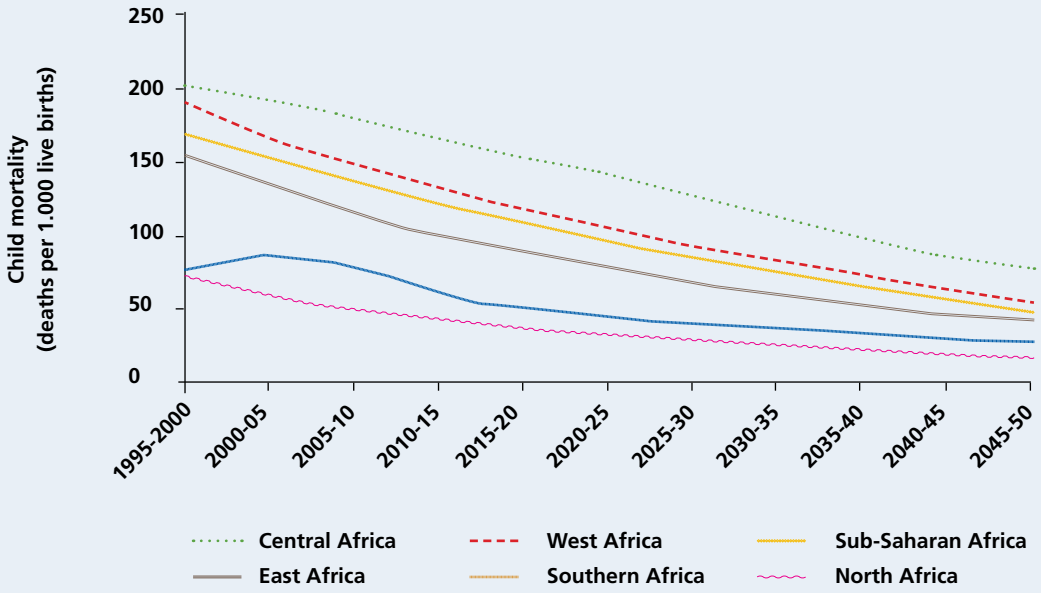
In analyzing the key determinants of a demographic transition, under-five mortality rates and fertility rates differ across the different regions of the continent. Africa as a whole has seen a reduction in the under-five mortality rate over the past 50 years, from a ratio of 307 out of 1000 children dying before year five in 1950-1955, to 126 out of 1000 in 2005-2010 (UNDESA, 2015). Southern Africa currently has an under-five mortality rate of around 17-50 per 1000 children, while sub-Saharan Africa has rates of over 150 per 1000 children (WBO, 2015).

In terms of reproduction, the total fertility rate of Africa has declined over the past 50 years, but slowly. In 2005-2010 women had 5.4 children on average, in comparison to 6.5 children in 1950-1955. Compared with East Asia, which moved from 5.6 children per woman to 1.4 within the same time period, Africa had an alarmingly slow pace of decline. The UN's medium variant projection predicts that fertility will fall from 4.7 children per woman in 2010-2015 to 3.1 in 2045-2050, and 2.2 by 2095-2100 (UNDESA, 2015).

As previously indicated, southern and northern Africa have made the most progress in reducing fertility, with southern Africa's total fertility rate being less than three children per woman (WBO, 2015). Similarly, capital cities throughout Africa, such as Accra, Ghana and Addis Ababa, Ethiopia, have achieved total fertility rates of around 2 children per woman, reaching the replacement rate needed for a demographic dividend (WBO, 2015).

Another success story that shows how policy has impacted demographics is found in Rwanda, where fertility rates dropped by 30% between 2010 and 2015. Rwandan women

CHILD MORTALITY TREND IN AFRICA



Source: UN Population Division 2012.

have been socially and economically transformed through access to education; educated women tend to have fewer children and are more empowered and independent in decision making compared to their illiterate counterparts.

Conversely, out of the top ten countries in the world with the highest fertility rates, sub-Saharan Africa holds nine positions, with Niger, Somalia and Mali holding the highest rates, of 7.63, 6.61 and 6.35, respectively (UNDESA, 2015). Both Niger and the Democratic Republic of Congo have seen a rise in fertility in the last decade. And the rural areas of the Democratic Republic of Congo are cited as having the highest rate in Africa at around 7 children per woman (WBO, 2015).

III. MAJOR CHALLENGES

The challenges of Africa's demographic transition lie in the distribution of resources at the household and public levels. Africa's stalled demographic transition is primarily due to the cycle of extreme rural poverty in the sub-Saharan region. Additionally Africa's challenge lies in the strain a large population puts on public resources and environmental boundaries.

Rural poverty

Sixty-three percent of the population in sub-Saharan Africa lives in rural areas (WBO, 2014) with high adult illiteracy, low access to formal healthcare, and low levels of maternal education. High fertility rates and mortality rates are symptoms of extreme rural poverty, as families compensate for the likelihood of losing a child. Without proper intervention, the cycle of poverty is perpetuated: large families with limited resources are unable to invest in their children's health and education. This produces a generation of children with reduced physical and cognitive development, as well as limited education, reducing their chances of breaking the cycle.

Strain on public goods and natural resources

Additionally, at the public and environmental level, untamed population growth puts immense stress on the capacity of public resources, including infrastructure and social services, as well as natural resources. The same quality-quantity trade-off experienced at the household level is felt at the national level, as most governments have a set budget available for

DEMOGRAPHY

2

Garden-soil mixing training in Mali.

health and education programs. Additionally if subsistence farming remains high, the amount of available arable land will diminish, which has implications for food security and ecosystem management (Sachs, 2015).

IV. KEY INTERVENTIONS

Strategic policies in health, education, gender, and economic development are needed for Africa to reduce its fertility rates and capitalize on the full benefits of a demographic dividend. Demography is a cross-sector policy issue that addresses several SDGs and garners much political support. Fertility transitions are directly linked to human development. Interventions therefore generate spillover effects and are all worthwhile.

Family planning

Family planning interventions are cost-effective and will play a major role in lowering fertility rates in Africa (WBO, 2015). Family planning programs and policies include increasing access to contraception and healthcare, offering education and awareness programs, and launching media campaigns that address cultural norms on fertility. Political leadership and social support are also needed in shaping social dialogue around fertility (Sachs, 2015).

Female education

Research shows that investing in female secondary education is a critical component of reducing fertility rates. Findings on education reform in Nigeria showed that, for every additional year of female education, fertility was reduced by 0.26 births (Osili and Long, 2008). Educational reform in Ethiopia shows similar trends: women who have completed secondary school have less than two children on average (Pradhan and Canning, 2015). Additionally, investments in children's education affect their wages as an adult: one additional year of schooling is associated with a 10% increase in earnings (Psacharopoulos, 1994).

Healthcare

In high-mortality environments in sub-Saharan Africa, approximately 25% of children die before age five (WBO, 2015). Fertility rates will not decrease until the under-five mortality rate decreases, as children are economic assets in subsistence farming lifestyles. By improving maternal health, child survival programs, and overall access to formal healthcare, mortality rates will decrease.

Job opportunities and financial institutions

To capitalize on the second demographic dividend, high-productivity jobs are needed to absorb the increase in labor supply. Recent increases in FDI point to potential in Africa's manufacturing sector as Asian labor becomes more expensive (WBO, 2015). However, infrastructure costs and trade barriers are still issues. Additionally, financial systems must be strengthened to encourage saving. South Africa has seen a rise in retirement savings in parallel with its demographic transition (WBO, 2015). Programs and policies will need mechanisms to assist workers to transition from informal to formal employment.

2 THEMATIC CHAPTERS

CLIMATE CHANGE

A man walks by an acacia tree in a desert area of Senegal's Louga Region. Photo © SDGC Africa, Gordon C. Shaw.

I. INTRODUCTION

Climate change represents a particular threat to African nations. It is already having profound effects in Africa, from the devastating floods of 2007 to wars which are already breaking out over land and water as people are forced to migrate to survive. There is good evidence that the change in temperature has affected the health, livelihoods, food productivity, water availability, and the overall security of the African people. According to the Climate Change Vulnerability Index for 2015, seven of the ten countries most at risk from climate change are in Africa. Africa has seen a decrease in rainfall over large parts of the Sahel and Southern Africa, and an increase in parts of Central Africa. Over the past 25 years, the number of weather-related disasters, such as floods and droughts, has doubled, resulting in Africa having a higher mortality rate from droughts than any other region.

Global climate negotiations have focused on identifying appropriate levels by which emissions can be reduced in order to reach the 2°C climate target. The gap between the agreed upon emissions target of 2°C and emissions levels that would be achieved if countries committed to their pledges is an important indicator to gauge progress in emissions reductions. Studies conducted by UNEP show that, though resolute and swift actions would likely make it technically possible to close the gap by 2020, the likelihood of failing to hit the 2°C target remains a reality.

CLIMATE CHANGE

2

In order to meet the 2°C target, the median estimate of global emissions in 2020 will need to be 44 GtCO2e. However, current emissions, based on the 2010 emissions inventory studies, are estimated at a median of 50.1 GtCO2e. This figure shows that current global emissions are not only 14% higher than the 2020 target, but also 20% higher than what the world emitted in 2000. The statistics thus suggest that emission levels will keep on growing.

However, the world can still meet the 2°C target. To do so, it must register net negative emissions by taking deliberate actions to remove substantial amounts of greenhouse gases from the atmosphere. Though seemingly ambitious and hard to realize, a number of options exist to make it a reality. Potential courses of action include: a concerted effort to reduce global energy demand; promoting carbon capture and storage; enhancing afforestation efforts; adopting and applying new technologies; countries committing to more ambitious emissions reduction pledges; and adopting effective accounting rules. Individual countries will have to make more ambitious pledges to reduce greenhouse gas emissions. All of these actions should be implemented, together with effective policies to support them. The government policies need to reward energy efficiency, green technological developments, and reductions in emissions. To achieve the target, these steps must be taken as soon as possible.

There is compelling evidence to show that, if appropriate policy actions are taken at all levels, including national and local levels, significant reductions in greenhouse gas emissions are possible. Among the many policies that have been tested worldwide, a number of targeted, sectoral policies have shown positive results in reducing emissions on both national and international levels. One sector in which such policies have shown promise is the construction sector, which has great potential to reduce emissions, specifically if emphasis is placed on ensuring the safety of lives and property while reducing energy costs and usage. The transport sector is another sector that could contribute to emissions reductions. Policies for the transport sector should target efficiency, proper land use for transport, and vehicle performance. The third sector that has also shown it can help to achieve the 2°C target is forestry. This is particularly the case if policies deliberately emphasize biodiversity conservation, culture and natural habitat conservation, watershed management, and protection of endangered species. It is worth remembering that for these policies to be effective there must be appropriate and effective ways of reproducing them, extending their scope and coverage. Above all, efforts will need to be properly supported and coordinated at national, regional, and even global levels.

African countries accounted for only 3% of global greenhouse gas (GHG) emissions between 1751 and 2011, compared to 27% of emissions from Asia, 29% of emissions from North America and 36% of emissions from Europe (Boden, Marland, & Andres, 2015). Warming projections, according to middle-ground scenarios, indicate that extensive areas of Africa will exceed 2°C warming by the last two decades of the century, compared to the late 20th century mean annual temperature. According to the worst-case warming scenario (over 4°C, globally), that 2°C rise could occur by mid-century across much of Africa and reach between 3°C and 6°C by the end of the century.

Africa's fossil-fuel CO2 emissions are low, in both absolute and per capita terms. Total emissions for Africa have increased twelve-fold since 1950, reaching 311 million metric tons of carbon in 2008. But that is still less than the emissions for some single nations, including Mainland China, the U.S., India, Russia, and Japan. Although Africa's per capita emissions in 2008 of 0.32 metric tons of carbon were three times those of 1950 levels, they were still only 6.6% of the comparable value for North America.

Emissions from all fuel sources have grown in the African region over time, with liquid and solid fuels now each accounting for approximately 35% and gas fuels accounting

for 16.9% of the regional total. A small number of nations are largely responsible for Africa's emissions from fossil fuels and cement production; South Africa accounts for 38% of the continent's total, and another 46% comes from Egypt, Algeria, Nigeria, Libya and Morocco combined. These are the only six countries on the continent with annual CO2 emissions in excess of 10 million metric tons of carbon. Only four African countries have per capita CO2 emissions higher than the global average (1.3 metric ton of carbon per capita per year): Libya (2.53), South Africa (2.39), the Seychelles (2.22), and Equatorial Guinea (1.99). Based on 2008 per capita emission rates, 28 of the 55 African nations for which data are available have per capita emission rates of less than 0.1 metric tons of carbon per person per year.

II. MAJOR CHALLENGES

Flooding

Flooding is the most prevalent cause of disaster in North Africa, the second most common in East, South and Central Africa, and the third most common in West Africa (AWDR, 2006). In North Africa, the 2001 flood in northern Algeria resulted in about 800 deaths and economic losses of around $400 million. In Mozambique, the 2000 flood (worsened by two cyclones) caused 800 deaths, affected almost two million people (of which around one million needed food assistance), displaced 329,000 people and destroyed large amounts of agricultural production land (AWDR, 2006).

Drought

Between July 2011 and mid-2012, a severe drought affected the entire East Africa region. The UN called it the worst drought in 60 years. 17 African countries are currently dealing with the impact of two consecutive years of drought. In 2017, more than 38 million people were considered "at risk" according to the humanitarian news service, IRIN.

III. KEY INTERVENTIONS

Promote clean energy and enhance investments in energy efficiency

The increased provision and use of energy and its associated services is a fundamental element of enhanced economic development. Increased access to energy has a proven link to economic development and poverty alleviation. Africa has the world's lowest electrification rate; nearly 75% of the African population lack access to electricity. However, in recent years, rapid urban growth has led to increases in aggregate commercial energy demand and linked emissions. On average, the demand for access to modern energy in Africa is growing faster than the supply. Balancing demand with the need to promote clean energy that relies on renewable energy resources is essential for a low-carbon development pathway.

Enhancing sustainable land use and forestry management

Africa's rate of deforestation is about twice the global rate; the continent is losing more than four million hectares of forest cover every year. Deforestation and poor agricultural practices account for about 65% of Africa's emissions. Addressing climate change requires action to reverse deforestation on the continent.

Supporting innovative technology

The development and deployment of technology plays an increasingly critical role in the global response to the challenges of climate change. Vulnerable communities in particular require both financial and technological support to adapt to climate change.

Improving climate finance

African countries need to maximize the return on their investments by applying a more streamlined and efficient use of the various climate-related financing instruments available to them.

CLIMATE CHANGE

2

LAGOS CABLE TRANSIT, NIGERIA

Description:

With over 16 million inhabitants, Lagos is one of the most densely populated cities in the world. Rapid urban growth, decades of inadequate urban planning and a challenging natural topography have resulted in road congestion and related pollution. The average commuter in Lagos spends over three hours in traffic every day. In 2008, to respond to the lack of formal mass transit systems in Lagos, a Bus Rapid Transit (BRT) system was introduced to cater to some 200,000 commuters. However, due to severely congested roads and bridges, ground-based solutions have had limited impact. Thus, a cable-car network, called the Lagos Cable Transit project, is under construction.

Impact:

By taking cars and buses off the streets, the project stands to significantly reduce congestion and carbon emissions in Lagos. The project stands to provide an affordable and reliable mass transit system for over 350,000 people in Nigeria's economic capital. It aso stands to impact the lives of up to 350,000 commuters through 10 kilometers of Tricable Ropeway Technology, reducing commuting times from up to three hours to just 15 minutes.

Lagos cable transit stations.

Conjusted traffic in Lagos.

350,000 commuters

Cable-cars reduced commuting times.

3 hours

15 minutes

3 REGIONAL CHAPTERS

THIS SECTION PROVIDES REGIONAL OVERVIEWS

Central Africa

East Africa

North Africa

Southern Africa

West Africa

REGIONAL CHAPTERS

3

1. INTRODUCTION

Given that the three main pillars for sustainable development are economic growth, social inclusion and environmental sustainability, this section will address each of them by sub-region: Central, East, North, Southern and West Africa, acknowledging that each African region has its own unique economic, social and environmental ecosystems, challenges to address and opportunities to leverage.

The sub-regional analysis, which has clustered African Countries into five regions based on the African Development Bank Guidelines (AfDB, 2016), provides a comprehensive local appraisal of problems faced by countries that share similar topographies, cultures and economies. It aims to identify regional challenges and propose regional policy priorities to be effectively addressed.

African leaders have recognized regional integration as a means to support Africa's economic development through a desire to build a common market for goods and services. The Programme for Infrastructural Development in Africa (PIDA) seeks to work with national governments to achieve this goal, through improving access to integrated regional and continental infrastructure networks. PIDA further allows countries to meet forecast demand for infrastructure services and boost competitiveness by: increasing efficiencies; accelerating growth; facilitating integration in the world economy, and improving living standards and unleashing intra-African trade (PIDA, 2015). Specific sub-regional PIDA projects are included in each sub-section.

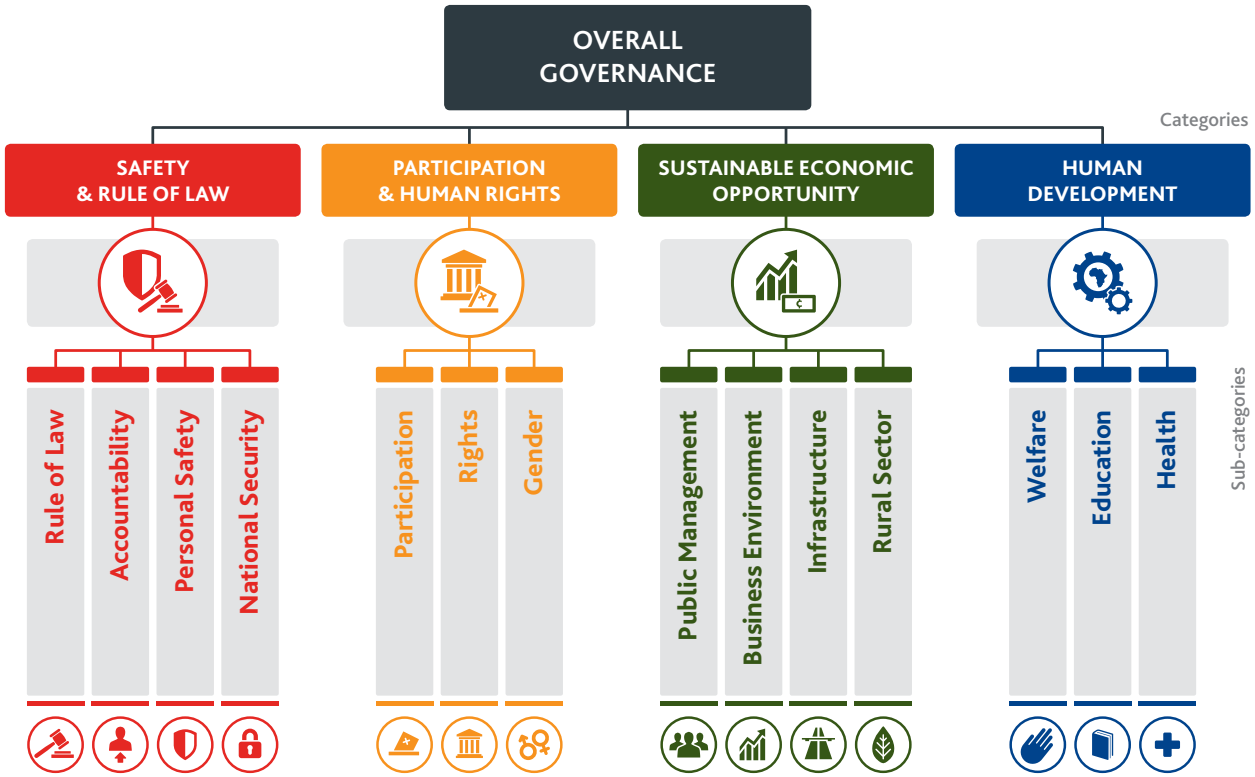
Finally, governance is recognized as a cross-cutting element that is deeply interconnected with the three pillars of sustainable development, and that needs to be addressed by all national governments across the continent. Hence, an overall analysis of the governance status, challenges and priorities in Africa follows.

Good governance

Sustainable development and peaceful societies can only be achieved with transparent, efficient and stable institutions; good governance is a key issue that cross-cuts the pillars and the sub-regions. Much progress has been made, through peace agreements, and disarmament, demobilization and reintegration processes. However, the political scenario on the continent continues to be characterized by ethnic and religious conflicts, civil unrest, coup d'états, terrorist threats, electoral disputes, the proliferation of arms and other internal conflicts. Several civic protest movements across the continent reflect people's discontent with the social and political status quo. Citizens are demanding institutional change, more democratic and representative governments, transparency, accountability, social equality and, on the whole, better life conditions. African states need to strengthen their institutions and enhance their national checks and balances in order to achieve good governance.

The Ibrahim Index of African Governance (IIAG) is a quantifiable tool to measure and monitor governance performance in African countries, to assess progress over time, and to support the development of effective and responsive policy solutions. The Overall Governance score is calculated according to performance in four main categories – Safety & Rule of Law, Participation & Human Rights, Sustainable Economic Opportunity, and Human Development – which are measured by combining scores in sub-categories. Each sub-category is assessed according to a number of indicators. The 2016 IIAG took account of 237 different indicators in total. It is not enough to consider the Overall Governance score; please see Annex I for the full list of indicators for each sub-category.

IIAG defines governance as "the provision of the political, social and economic public goods and services that every



Source: 2016 Ibrahim Index of African Governance Report.

citizen has the right to expect from their state, and that a state has the responsibility to deliver to its citizens. The IIAG focuses on measuring outputs and outcomes of policy, rather than declarations of intent, de jure statutes and levels of expenditure" (Ibrahim Index of African Governance Report, 2016).

According to the 2016 Ibrahim Index of African Governance Report, the majority (70%) of African citizens live in a country that has seen improved governance. 37 countries improved their Overall Governance score, while the continent's average improved by one point, from 49.0 to 50.0, between 2006-2015. This progress is driven by positive results in three of the four categories that make up the Overall Governance score (Safety & Rule of Law is the only category that has experienced a negative trend). While there is progress, it should be noted that an increase of one score point for the continent is minimal.

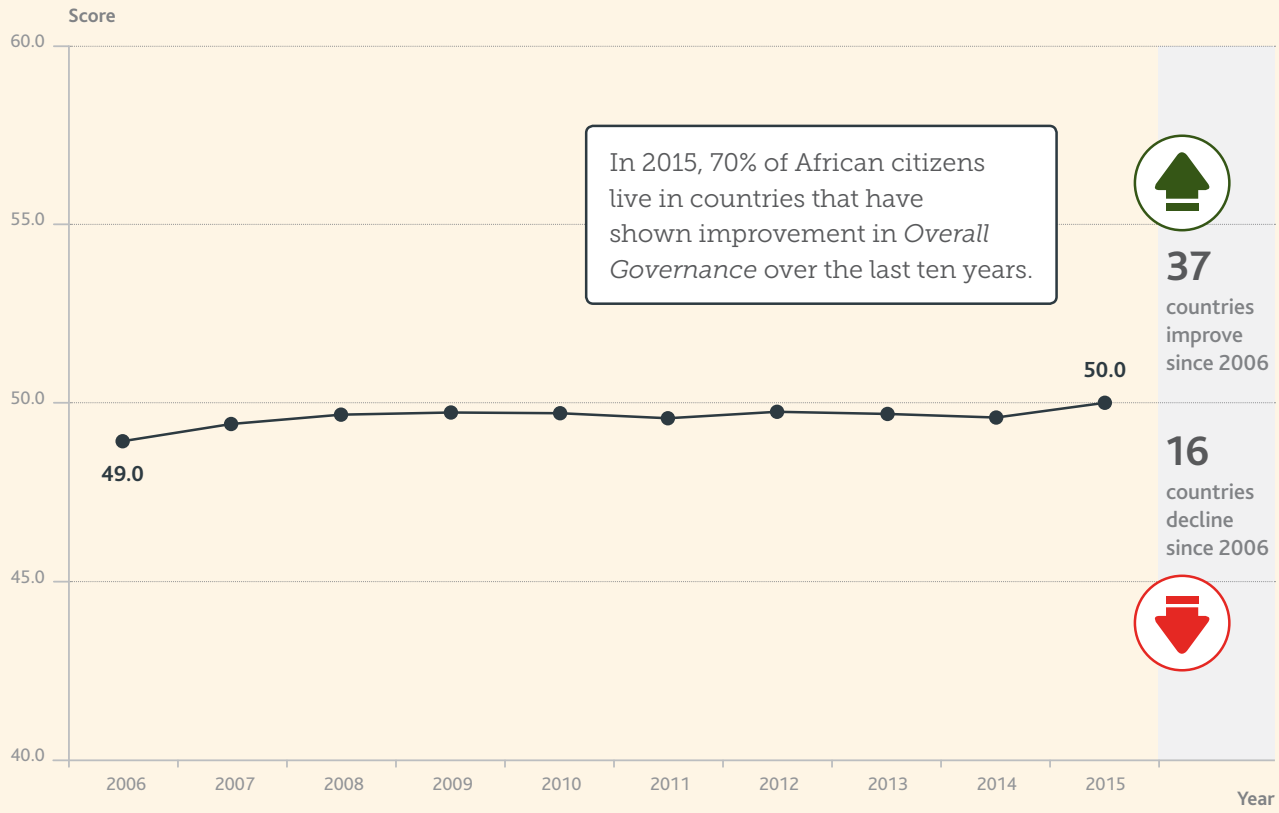
In 2015, only four countries – Botswana, Cabo Verde, Mauritius and Seychelles – had an Overall Governance score of 71 or over. This represents only 0.4% of the African population. Somalia and South Sudan scored below 23 points, between them representing 2% of the continent's population. The vast majority of African citizens (83%) live in countries that scored between 41 and 70.9 points in terms of Overall Governance. Over the past ten years, almost one third (16) of the countries improved their scores, with most of them moving upwards in the index; 10 moved up and six moved down.

INTRODUCTION

3

Summary of African average scores & trends 2006-2015

Findings show a very slight upward trend: up one point from 49.0 to 50.0.



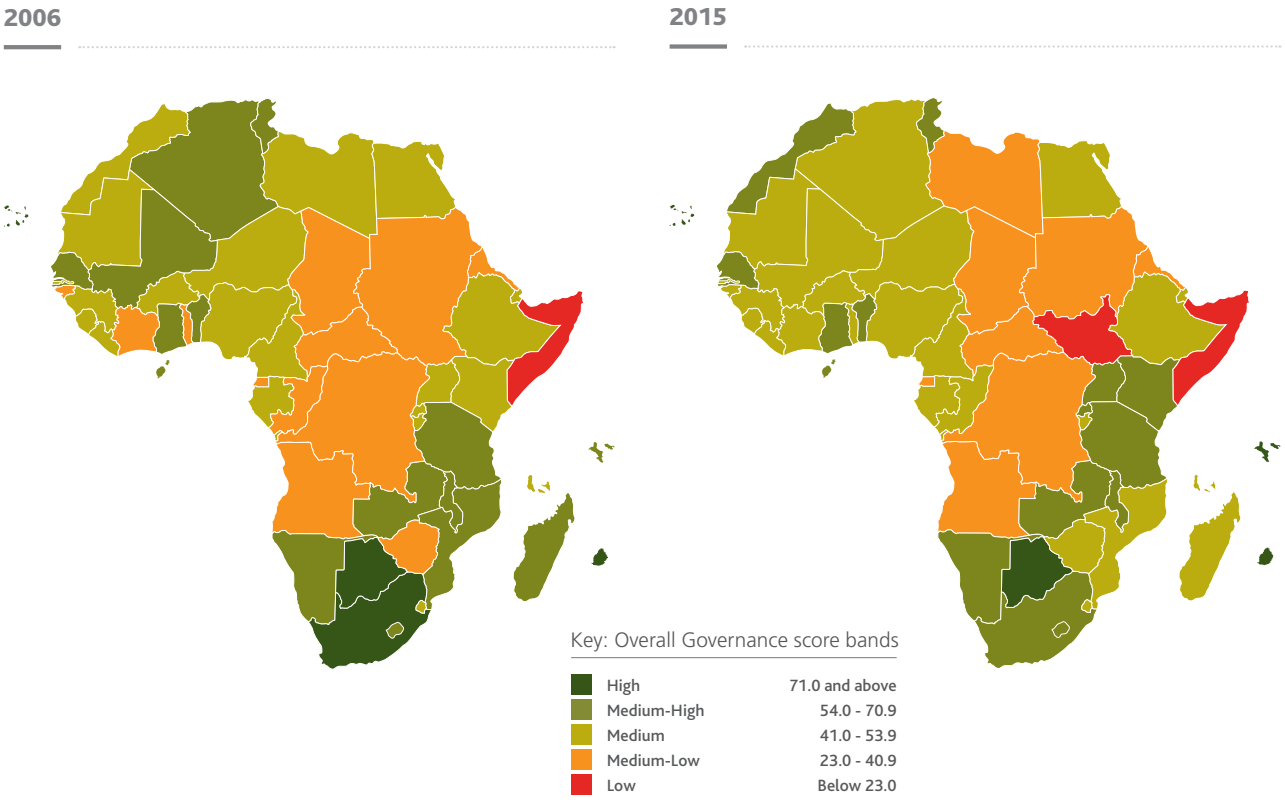
Source: 2016 Ibrahim Index of African Governance Report.

There are five banding thresholds ranging from low to high performance. Over the past ten years, most countries improved their performance and 10 moved up a band. The ten countries out of 54 that have moved up a band in their Overall Governance score are Congo, Côte d'Ivoire, Guinea-Bissau, Kenya, Morocco, Rwanda, Seychelles, Togo and Uganda Zimbabwe. These countries represent 15% of Africa's population and 18% of Africa's GDP. The six countries that have dropped points are Algeria, Libya, Madagascar, Mali, Mozambique and South Africa. These countries represent 14% of Africa's population and 15% of Africa's GDP. Overleaf is an illustration of how the Overall Governance score changed for each country from 2006-2015.

It is important to note that the Overall Governance score provides an overview of how a country is doing. A high Overall Governance score does not necessarily mean that a country has perfect or excellent governance, or that it is improving in the four categories that make up the scores. It is possible for high scoring countries to have negative trends in Safety & Rule of Law, Participation & Human Rights, Sustainable Economic Opportunity, and/or Human Development. For example, of the top ten scoring

3 REGIONAL CHAPTERS

OVERVIEW OF OVERALL GOVERNANCE SCORES, 2006 AND 2015



Source: 2016 Ibrahim Index of African Governance Report.

countries for Safety & Rule of Law in 2015, (Botswana, Mauritius, Cabo Verde, Namibia, Seychelles, Ghana, Lesotho, South Africa, Zambia and Senegal), over half (six) show a deterioration since 2006. South Africa registers the largest decline, followed by Ghana, Cabo Verde, Botswana, Seychelles and Mauritius. In order to gain a complete sense of how each country is doing, one must review the results of each category and sub-category.

Strengthen institutional capacity and enhanced checks and balances

The frequency of political crises, civil-military tensions, rebellions and military coups is closely correlated with weak national institutions. With a few exceptions, electoral processes and democratic mechanisms are generally flawed, and the executive power is often accused of misusing its office to undermine checks and balances.

Strengthening the institutional capacity of state and non-

INTRODUCTION

state stakeholders at national and local levels needs to be a priority in the agenda. It is needed to create effective mechanisms for policy implementation, accountability and responsiveness. Institutional capacity building may occur by engaging civil society, the private sector and government in collective and active participation mechanisms, such as technical and budgetary planning, performance orientation assessment, civic oversight and accountability for public service delivery. Boosting the resources and capacity of local agencies to design and deliver public services by reforming the civil service codes and human capital requirements will enhance service orientation and professional competence.

Additionally, in order to have a balanced and fair allocation of power, greater independence should be granted to the judiciary system. Constraints to the executive should also be more operational. The professional capacities in legislative and judicial systems should improve, and, lastly, independent oversight agencies should have greater capacity and authority for monitoring these systems.

Improving accountability and increasing civic voice and representation

Citizens must have improved and increased access to tools that hold governments to account. Civic participation and representation should be strengthened, the transparency of democratic processes should be increased. Public criticism of the government should be allowed. This means the broadening of government consultative mechanisms, the fostering of civil society-based organizations, the increased public disclosure of government actions, the safeguarding of freedom of information and expression, promotion and protection of independent and responsible media, and generation of spaces for public debates.

African countries have some of the highest rates of corruption in the world. Governments in the region need to be more efficient in delivering goods and services to their citizens in a transparent manner. Enhancing media and civil society, improving public financial management, and fostering fiscal decentralization and domestic resource mobilization can achieve this. Governments should enact mechanisms to be more representative, accountable and efficient in delivering basic goods and public services to their citizens. Furthermore, they should be competent managers of their public finances and build a strong and reliable state presence to safeguard security.

According to the 2016 Corruption Perceptions Index released by Transparency International, the average score of perceived corruption in the public sector (i.e. administrative and political corruption) in Africa is 31.5, with Botswana ranking the highest and Somalia ranking the lowest. Corruption and inequality are closely related and interact in a vicious circle: corruption leads to an unequal distribution of power which, in turn, translates into the unequal distribution of power, wealth and opportunity becoming ever more entrenched in society.

Please see Annex II for Corruption Perception scores for the African continent as well as the full global ranking.

Ensuring peace and strengthening regional security

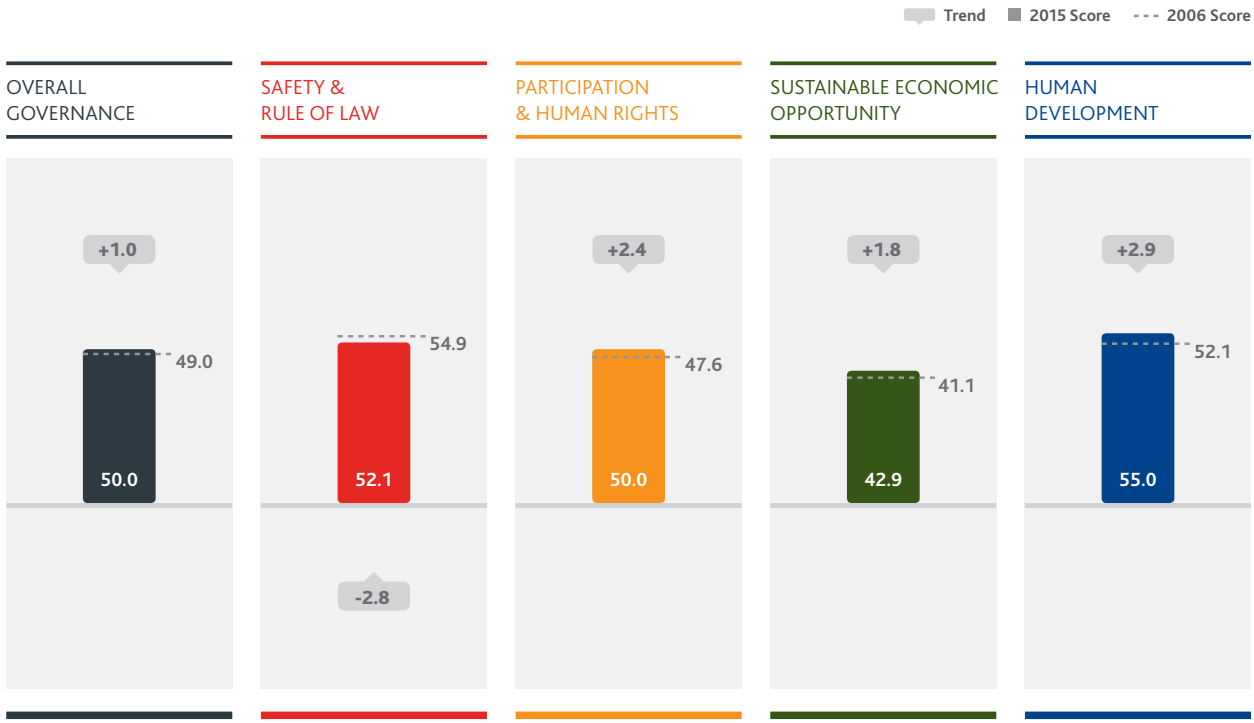
African countries face varying degrees of security threats. Sub-regions have varying levels of socio-political instability, rebellion, intra-and inter-ethnic conflict, inter-state conflicts, illicit trafficking in arms, drugs, humans and minerals, and fighting over the control of resources.

This insecurity has had a significant impact on development efforts and has undermined prospects for structural stability. It has caused the death of millions of people, inflicted abuses, swelled the influx of refugees and displaced persons, and caused collateral damage to material resources. Restoring peace is therefore a major priority for sustainable development in each sub-region.

According to the 2016 IIAG Report, in 2015, a majority of African citizens (64%) live in countries where Safety and

3 REGIONAL CHAPTERS

2006-2015 AVERAGE TREND & SCORE AT OVERALL GOVERNANCE & CATEGORY LEVEL



Source: 2016 Ibrahim Index of African Governance Report.

Rule of Law has deteriorated in the last ten years. In this category, 33 countries have shown a decline, while only 19 have registered an improvement. As illustrated below, Safety and Rule of Law is the only category that reflects a negative trend over the past decade. This negative trend, seen in the majority of African countries, is very concerning and could be holding back progress towards better governance. The 2016 report revealed that all countries with declining Overall Governance scores also had declining scores in each of the four sub-categories of Safety and Rule of Law.

Safety and Rule of Law is made of four parts: Rule of Law, Accountability, Personal Safety, and National Security. As noted, each of these four components that make up Safety & Rule of Law have deteriorated.

Personal Safety and National Security saw the greatest declines out of all 14 of the IIAG subcategories. 33 countries registered declining scores for Personal Safety over the past decade, with Libya registering the highest decline, followed by Central African Republic, Somalia, Gambia, Burundi, Burkina Faso, Eritrea, Madagascar, Morocco, Tunisia, Malawi, Guinea-Bissau, Guinea, Mozambique and Democratic Republic of Congo. 30 countries registered a decrease in National Security, with Libya seeing the highest decline, followed by Nigeria, Egypt, Cameroon and Central African Republic. Meanwhile, 20 countries improved in

INTRODUCTION

3

Ambulance Driver, Ghana.

terms of National Security over the last ten years, with Uganda seeing the highest improvement, followed by Liberia.

Accountability, within Safety and Rule of Law, is the lowest scoring sub-category of all. Meanwhile, six of the 10 indicators that have shown the largest deteriorations over the past decade are in the Safety and Rule of Law category: Government Involvement in Armed Conflict, Safety of the Person, Violence by Non-state Actors, Human Trafficking, Corruption and Bureaucracy, and Social Unrest.

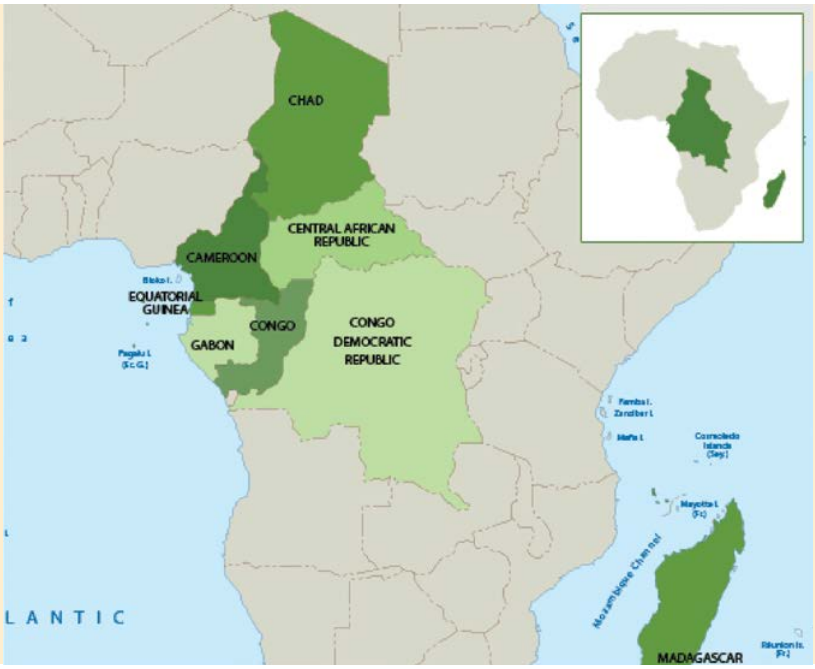
While cross-border tensions (conflicts between neighboring states) have declined over the past ten years, there have been widening and deepening internal conflicts, including government involvement in armed conflict and violence by non-state actors on the continent over the past decade.

19 countries have shown an improvement in Safety and Rule of Law over the past decade. Côte d'Ivoire is the most improved country, followed by Togo and Kenya.

Recognizing the disastrous social and economic impact of conflict, countries of the sub-region should enhance regional mechanisms and institutions that channel the cooperation of state members towards meeting the challenges, including: cross-border crime, arms proliferation, the youth crisis, and marginalization of women. Political, security-related, and natural resource governance should be reinforced by demanding greater participation of all member states on all regional issues.

3 REGIONAL CHAPTERS

CENTRAL AFRICA



1. Cameroon
2. Central African Republic
3. Chad
4. Congo
5. Democratic Republic of Congo
6. Equatorial Guinea
7. Gabon
8. Madagascar

The Central Africa sub-region comprises eight countries: Cameroon, Central African Republic, Chad, Republic of Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon and Madagascar. Central Africa occupies a pivotal position, sharing boundaries with all regions of the African continent, and is thus a cornerstone of physical continuity in terms of African integration.

Central Africa's population has rapidly increased over the last three decades, and currently accounts for approximately 16% of sub-Saharan Africa's population. The sub-region's population is expected to rise by 50% from the current 151 million to over 228 million by 2030. The Democratic Republic of Congo is the most populated country in Central Africa with 77.3 million people, followed by Madagascar and Cameroon with 24.2 million and 23.3 million people respectively. Equatorial Guinea is the least populated country with 0.9 million people, followed by Gabon with 1.7 million people.

I. ECONOMIC SUSTAINABILITY

Economic growth

Despite the global financial crisis, the Central African sub-region has registered economic growth over the past two decades. The economic growth is primarily from natural resources and services. In 2013, Central Africa recorded 3.9% economic growth, against 5.6% in 2012. The Democratic Republic of Congo recorded the highest real GDP growth of 8.5% in 2013 and 9% in 2014, primarily from agricultural activities. Similarly, Chad's GDP grew to 7.3% in 2014 from 5.7% in 2013, mainly from agricultural and mining activities.

CENTRAL AFRICA

3

Equatorial Guinea registered negative economic growth in 2013 and 2014, having failed to recover from the 2013 recession caused by cheaper oil prices and lower oil and gas production. To maintain its budgetary balance in 2014, the country drew reserves from offshore banks and the Bank of Central African States (BEAC).

The economies of Congo and Gabon relied mainly on oil while Cameroon, Central African Republic and Madagascar relied mainly on agricultural activities. Cameroon, the Democratic Republic of Congo and Chad contributed 47.2% of Central Africa's GDP at market prices in 2014.

ECONOMY GROWTH AND SIZE, POPULATION – CURRENT AND 2030 PROJECTION

Country	Real GDP growth (%) (a)					GDP Contribution to region 2014 (%) (a)	Total population (b)	
	2010	2011	2012	2013	2014		2015 (million)	2030 Projection (million)
Cameroon	3.3	4.1	4.6	5.6	5.9	24.7	23.3	33
Central African Republic	3	3.3	4.1	-36	1	1.2	5	6.5
Chad	13.6	0.1	8.9	5.7	7.3	11.0	14	21.9
Republic of the Congo	8.8	3.4	3.8	3.4	6.8	9.9	4.6	6.8
Democratic Republic of Congo	7.1	6.9	7.2	8.5	9	22.5	77.3	120.3
Equatorial Guinea	-3.8	1.9	5.8	-6.5	-0.3	10.7	0.9	1.2
Gabon	9.1	7.1	5.3	5.6	4.3	13.3	1.7	2.3
Madagascar	0.3	1.5	3	2.3	3.3	6.8	24.2	36
Central Africa*	**5.3**	**4.1**	**5.6**	**3.9**	**5.7**	**100**	**151**	**228**

Source: (a) World Bank (b) UN Population Division Department of Economic and Social Affairs (-) missing data (*) based on authors' calculations.

CENTRAL AFRICA

National unemployment rates within Central Africa vary dramatically. The 2014 total unemployment rate in Central Africa is highest in Gabon at 19.7%, with even higher youth unemployment of 35.5%. The 2014 total unemployment rate for other countries in the sub-region is between 4% and 8%, while youth unemployment ranges from 6% to 12% (World Bank, 2014).

Unemployment rates in the Democratic Republic of Congo decreased from 8.2% in 2011 to 8.0% in 2014. Unemployment rates also reduced slightly in Chad, from 7.1% in 2011 to 7% in 2014, and in Congo, from 6.6% in 2011 to 6.5% in 2014. Madagascar, which has the lowest rate in the region, maintained a steady unemployment rate of 3.6% from 2011 to 2014.

On the contrary, unemployment rates increased in Cameroon, Central African Republic and Equatorial Guinea between 2011 and 2014. Overall the unemployment rates are still very high in Central Africa, despite sustained economic growth and an abundance of natural wealth.

Poverty

While Central Africa has made modest strides in reducing poverty levels, 70% of the sub-region's population still live on less than $1.25 a day, with most of the poor living in rural areas (UNDP-HDI, 2015). Democratic Republic of Congo and Madagascar have made slow progress: in both, 88% of the population lived below the poverty line between 2002 and 2012.

Poverty remains prevalent in Central Africa Republic (62.8%), Equatorial Guinea (43.4%), Chad (36.5%), Congo (32.8%) and Cameroon (27.6%). Poverty rates within the sub-region are lowest in Gabon, at 6.1%.

POVERTY LEVELS – CURRENT AND 2030 PROJECTION

Country	Population living on below $1.25 PPP per day		
	(%) 2002-2012 (a)	2002-2012 (million) (b)	2030 (million) (b)
Cameroon	27.6	6.4	9.1
Central African Republic	62.8	3.1	4.1
Chad	36.5	5.1	8.0
Republic of the Congo	32.8	1.5	2.2
Democratic Republic of Congo	87.7	67.8	105.5
Equatorial Guinea	43.4	0.4	0.5
Gabon	6.1	0.1	0.1
Madagascar	87.7	21.2	31.6
Central Africa*	**70.0**	**105.7**	**161.2**

Source: (a) UNDP HDI 2015 (b) Estimated based on UNDP-HDI 2014 Population (*) based on authors' calculations.

CENTRAL AFRICA

3

If the current poverty rates prevail, nearly 161.2 million people will be living on less than $1.25 a day by 2030.

Central Africa has enormous agricultural potential, with agro-ecological conditions conducive to the production of a wide variety of crops. Unfortunately, vast tracts of agricultural land are unused. Of a surface area of 6.7 million km^2, 1.6 million km^2 is arable land, yet only 3.75% of it is farmed (UNECA, 2013).

Ethnic tension, internal displacement and political and economic instability have exacerbated food insecurity within the sub-region. With the exception of Equatorial Guinea (due to missing data), the average cereal yield per hectare for Central Africa was 1.4 tonnes between 2011 and 2014. However, Chad, Congo and Democratic Republic of Congo consistently yielded less than that during the period (World Bank, 2016).

Gabon and Madagascar saw slight reductions in cereal yields per hectare, from 1.7 tonnes in 2011 to 1.6 tonnes in 2014 (Gabon), and 2.7 tonnes in 2011 to 2.4 tonnes in 2014 (Madagascar). Central African Republic increased its cereal yield production from 1.5 tonnes in 2011 to 1.6 tonnes in 2014, while Gabon maintained a cereal production of 1.7 tonnes per hectare for the same period.

Infrastructure and energy

Central Africa is the sub-region with the poorest transport network on the continent. Around 80% of people and goods are transported by land. However, Central Africa's paved roads represent less than 12% of the continent's road network (World Bank, 2014).

Railway systems in Central Africa are not connected and railway lines are currently outdated and underused.

In terms of air transport, although Central Africa is the region with the most liberalized sector, it is plagued by lack of connectivity between countries due to the collapse of several airlines in the region, the age and poor state of aircraft, low competition and limited airport infrastructure.

The limited capacity of the region's ports mean that maritime freight costs are high. The major ports in Central Africa are ill-equipped to handle growing demand for the transport of containers. The waiting period could be up to 80% of the total delivery period for merchandise in Central Africa, compared with 20% in East Asia. This situation, coupled with limited transport facilitates once on land, has raised maritime transport costs substantially (AfDB, 2011).

Insufficient energy has been a major hurdle on Central Africa's path to increased economic growth. The river network in the sub-region accounts for 60% of Africa's hydroelectric potential, and the sub-region has a non-negligible power generation potential of 166 gigawatts. However, its energy sector is the least developed on the continent. (AfDB, 2011).

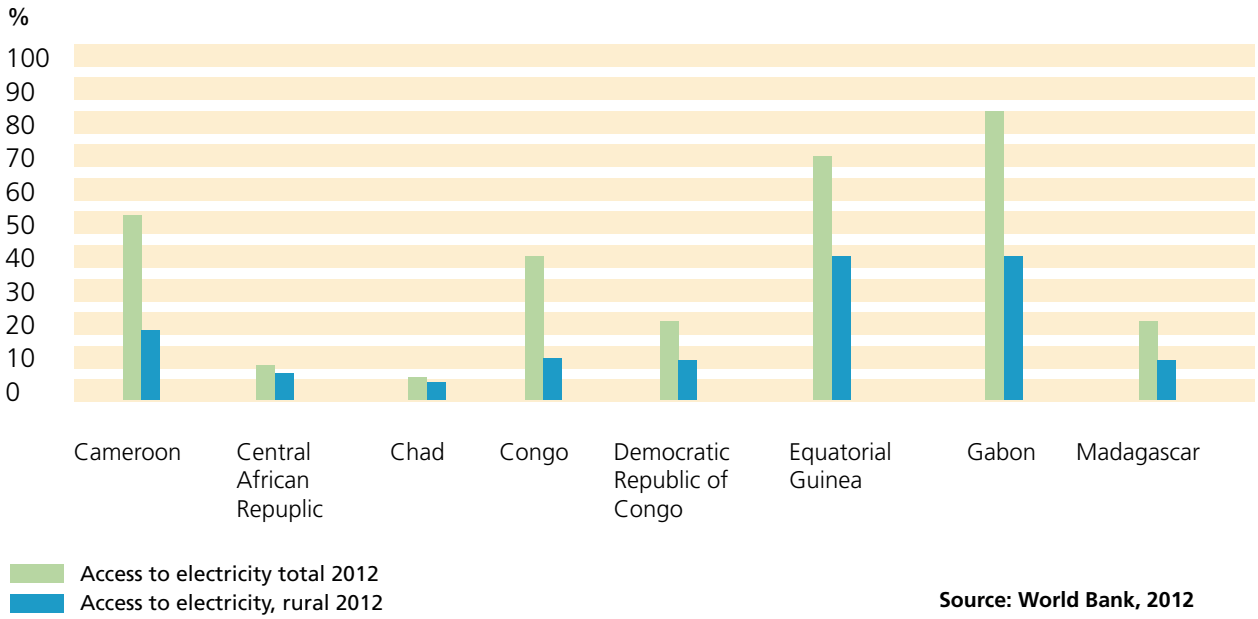
Approximately 75% of total installed capacity comes from hydropower, with most of it from thermal plants. Central Africa currently has a low electrification rate (37%) and the current share of rural electricity demand is negligible (AfDB, 2014).

In the future, electricity demand is expected to increase from approximately 20 terawatt-hours (TWh) in 2010 to 90 TWh in 2030. Urban, industrial and rural demands are projected to account for 57%, 39% and 4% respectively of final electricity demand in 2030 (IRENA, 2015).

3 REGIONAL CHAPTERS

CENTRAL AFRICA

ENERGY ACCESS



Source: World Bank, 2012

Gabon has the highest electrification rate of 89.3%, followed by Equatorial Guinea (66%), Cameroon (53.7%) and Congo (41.6%). Central African Republic, Chad, Democratic Republic of Congo and Madagascar have electrification rates of no more than 16.5% and rural electrification rates of no more than 8.3%.

Energy capacity remains a priority issue for sustainable development in Central Africa. Major initiatives are underway to develop the energy resources in order to close the region's electrification gap and reduce dependence on other regions of the continent. The Inga III hydroelectric project and the Central African Interconnection, a 3,800 km power transmission line, are two projects underway (PIDA, 2015).

Mobile cellular subscriptions in East Africa stand at 56% on average, with the largest number in Gabon followed by the Republic of Congo, and the lowest number, 25 per 100 people, in Central African Republic.

Internet use is much lower in the Central Africa sub-region than elsewhere, at just 3%. Equatorial Guinea has the highest proportion of internet users (18.9%), followed by Gabon (9.8%). The lowest internet penetration is found in the Democratic Republic of Congo, where just 3% have access to the internet (World Bank, 2014). Persistent conflict has hampered developments in telecommunications and media in the sub-region.

II. SOCIAL INCLUSION

Gabon, the Republic of Congo and Equatorial Guinea were ranked 'medium' on the human development index

CENTRAL AFRICA

3

(HDI) scale, with scores of 110, 136 and 138 respectively. The other countries in Central Africa ranked 'low'. Central African Republic had the lowest HDI score of 187, followed by Chad with 185. Sudan also scores poorly in terms of HDI, ranking 167 (UNDP HDI, 2015).

Health

Over the last decade, sub-regional health indicators have improved remarkably. Central Africa's under-five child mortality dropped from 103.3 per 1,000 live births in 2010 to 86.9 in 2015.

Child mortality reduced significantly between 2010 and 2015 in the following countries: Chad (160 to 139), Central African Republic (150 to 130), Democratic Republic of Congo (116 to 98), Equatorial Guinea (111 to 94), Cameroon (105 to 88), Congo (61 to 45), Gabon (63 to 51) and Madagascar (60 to 50). Despite these increases, Central Africa still falls short of the MDG targets of cutting deaths by two thirds (World Bank, 2015).

HEALTH INDICATORS

Country	Under five mortality (per 1,000 live births) 2015	Life expectancy at birth, total (years) 2014	Prevalence of under-nourishment (% of population) 2014	Adolescent fertility (births per 1,000 women ages 15-19) 2014	Tuberculosis (per 100,000 people) 2014	HIV prevalence, adults (% ages 15–49) 2014
Cameroon	88	55	10	107	220	4.8
Central African Republic	130	51	48	93	375	4.3
Chad	139	52	34	137	159	2.5
Republic of Congo	45	62	31	119	381	2.8
Democratic Republic of Congo	98	59	-	123	325	1.0
Equatorial Guinea	94	58	-	110	162	6.2
Gabon	51	64	5	102	444	3.9
Madagascar	50	65	33	117	235	0.3
Central Africa *	86.9	58.3	12.6	113.5	287.6	2.2

Source: World Bank Development indicators, 2016; (-) Missing data (*) based on author´s calculation.

3 REGIONAL CHAPTERS

CENTRAL AFRICA

Despite improvements as a result of lower maternal and child mortality, according to the human development index, the sub-region still faces poor life expectancy. The average life expectancy of the sub-region increased from 56.1 years in 2010 to 58.3 years in 2014, which is still relatively low compared to the global average of 71.5 years.

Central African Republic and Chad have the lowest life expectancy of 51 and 52 years respectively, while Madagascar has the highest life expectancy at 65 (World Bank, 2015).

With the exception of Democratic Republic of Congo and Equatorial Guinea (due to missing data), undernourishment remains extremely prevalent in Central Africa. Specifically, Central African Republic was the second most under-nourished country in the world, with 48% under-nourished, following Haiti at 53% (World Bank, 2014). Undernourishment affected 34% in Chad, 33% in Madagascar, 31% in Congo, 10% in Cameroon and 5% in Gabon. Efforts to mitigate undernourishment have been hindered by sluggish and less inclusive economic growth, as well as political instability.

Adolescent fertility rates in Central Africa reduced to 4.9 children from per woman in 2014, from 5.2 children in 2010. The adolescent fertility rate for women aged 15-19 per 1,000 reduced to 114 in 2014, from 125 in 2010 (World Bank, 2014). The sub-region's 2014 adolescent fertility rates were highest in Chad (137), followed by Democratic Republic of Congo (123), Republic of Congo (119), Madagascar (117), Equatorial Guinea (110), Cameroon (107), Gabon (102) and Central African Republic (93). Despite an increase in the use of contraception for birth control, fertility rates are still the highest in Africa.

National governments and development partners have been successful in reducing the spread of HIV in Central Africa. Prevalence of HIV as a total percentage of the population aged 15-49 fell between 2010 and 2014 in the following countries: Madagascar (0.4% to 0.3%), Democratic Republic of Congo (1.2% to 1%), Chad (3.0% to 2.5%), Congo (3.2% to 2.8%), Gabon (4.7% to 3.9%), Central African Republic (5.2% to 4.3%) and Cameroon (5.1% to 4.8%) (World Bank, 2014). On the contrary, the prevalence of HIV in Equatorial Guinea increased markedly, from 1.5% in 2000 to 6.1% in 2010, and, later, to 6.2% in 2014.

With the exception of Equatorial Guinea, the incidence of tuberculosis (per 100,000 people) in the sub-region reduced from 300 in 2010 to 283 in 2014 (World Bank 2014). Countries now have increased access to free HIV/TB treatment and enhanced prevention of mother to child transmission of HIV as a means to reduce HIV prevalence. However, access to HIV/TB treatment and testing services remains a challenge, especially in the rural areas. There is a need for national governments to scale up these interventions.

Malaria is endemic all year round and represents the leading cause of death and morbidity in Central Africa. Malaria accounted for 721 deaths per 100,000 people in 2012 (UNDP-HDI, 2015). 90% of malaria-related deaths are preventable and treatable. Malaria prevention and treatment is relatively cost effective, although limited by the capacity of health services and public health policies.

Education

Even though the number of children enrolled in educational systems in Central Africa has risen sharply since the turn of the millennium, the sub-region's challenging demographic and economic context means that it is still far behind the rest of the world in terms of school attendance. Achieving equality, based on place of residence, gender and income, remains a significant problem in primary, secondary and tertiary education. Nevertheless, nearly all the countries in the sub-region officially offer free and compulsory primary education.

CENTRAL AFRICA

3

Young boy and girl attending primary school in Central African Republic. Photo © Pierre Holtz for UNICEF.

The average number of years spent in school was 5.4 in 2014, significantly less than the 9.7 years that are expected. Chad has the poorest average score in terms of years of schooling (1.9 years of an expected 7.4), followed by Central African Republic (4.2 years of an expected 7.2) (UNDP HDI, 2015).

Overall, the youth literacy rates are low, considering that countries were expected to attain a 100% literacy rate in the 15-24 years age bracket by 2015. Only 36.4% of the youth (aged 15 to 24 years) in Central African Republic and 52.8% in Chad are literate, while youth literacy rates are lower in females as compared to males (UNESCO, 2015).

The sub-region must ensure full gender parity and 100% primary enrollment and completion rates by 2020. Additionally, it must achieve 80% secondary and tertiary enrollment and completion by 2025. However, the primary

CENTRAL AFRICA

gross enrollment in Equatorial Guinea, where it is lowest, is just 84.5%, followed by Central African Republic, where it is 93.5%. Gross enrollment is extremely low at secondary level (less than 57%) and even lower at tertiary level (less than 12%) within the sub-region.

Gender and inequality

Women in Central Africa make a sizeable contribution to the sub-region's economy, primarily as farmers and entrepreneurs. Unfortunately, women have less access to land than men. This in turn restricts the sub-region's economic growth. While Central Africa has made modest progress in closing the gender gap in primary education, women are not fulfilling their potential (UNECA, 2013).

There are glaring inequalities in the political participation of men and women; no country in the sub-region has the same number of women in parliament as men. Central Africa has made modest progress, increasing the proportion of seats held by women in national parliaments from an average of 10 in 2010 to 17 in 2015 (World bank, 2015). Cameroon had the highest number of women in parliament in 2015 (31 women) while the Republic of Congo had the fewest (7 women).

The countries in the Central African sub-region also have high Gender Inequality Indices (GII) ranging from 0.514 for Gabon and 0.706 for Chad (UNDP-HDI, 2015).

Armed conflict and post-conflict reconstruction in Central Africa pose specific challenges to achieving gender equality and the protection of women's rights. The exclusion of, and discrimination against the latter in power circles as well as in the allocation of resources and levels of income, have been identified as factors that continue to stoke a culture of violence.

III. ENVIRONMENTAL SUSTAINABILITY

More than 100 million people in Central Africa rely heavily on primary activities linked to natural resources. Given the growing population, the expanding economy has placed greater demands on land, water, forests, minerals, and energy resources. Cameroon, Central African Republic, Democratic Republic of Congo, Equatorial Guinea, Gabon and the Republic of Congo have the majority of the dense humid tropical forest. They are similar in ecology but differ in the governance, legal frameworks and institutional capacities required to manage their natural resources.

Climate change

Central Africa is extremely diverse in terms of ecosystems, with fertile soils, water bodies, mineral reserves and forests. All of these present potential for sustainable development. The sub-region has the second largest reserve of dense rainforests in the world, and 70% of the humid and dense forest-cover on the continent. Its unique biodiversity includes nearly half of all species known on earth, and numerous iconic species such as gorillas, chimpanzees, bonobos, hippopotamuses, leatherback turtles, whales, duikers, picathartes and Congo peacocks.

Land degradation, in the form of erosion and compaction, presents a major threat to natural resources in Central Africa. Vegetation faces large-scale destruction due to commercial logging and tree-cutting for domestic fuel, as well as clearance of forests for commercial or subsistence cultivation. With the exception of Gabon, Central Africa experienced extensive forest loss during the period 1990-2012 (UNEP, 2006). Cameroon incurred the greatest forest loss of (19.9%), followed by Equatorial Guinea (13.8%), Chad (13.3%), Madagascar (9.2%), Democratic Republic of Congo (4.3%), Central African Republic (2.8%) and Congo (1.5%) (UNDP-HDI, 2015).

CENTRAL AFRICA

3

Central African countries have profited significantly from mining and oil activities. Governments have made efforts to promote and ensure the transparency of social investments for the people, as part of their poverty reduction efforts. Special funds have been set up to distribute the gains from natural resources fairly between present and future generations, which will exceed 233 million people by 2030.

Rainfall is relatively high and reliable across the central and coastal parts of the sub-region but tends to diminish and become more variable towards the north. For example, Douala, in coastal Cameroon, has an average rainfall of 3,850 mm/year while Djamena, in Chad, receives only 500 mm/year, and suffers periodic drought.

Temperatures in the low-lying coastal forests vary little because persistent cloud keeps mean annual temperatures between 28°C. In the high-relief mountainous areas, mean annual temperatures are low, between 19°C and 24°C. Flooding is common in the more humid areas of Central Africa, especially where forests and natural vegetation have been cleared for cultivation or human settlements.

In the past 30 years, development policies and activities such as commercial logging, commercial or subsistence agriculture, and collection of firewood, have led to extensive clearing of forests. These changes have disturbed the sub-region's microclimate, increasing vulnerability to rainfall fluctuations.

Marine pollution is a concern in Central Africa, particularly in the Gulf of Guinea (from Guinea-Bissau to Gabon), and in the water bodies of oil-producing states. Central African Countries have developed Integrated Coastal Zone Management (ICZM) policies and programs at national levels. However, many countries have reportedly experienced slow progress. Over 80% of marine pollution comes from land-based activities, according to WWF. Tar balls have been found on the beaches of Pointe Noire, the economic capital of Republic of Congo, and inhabitants of the coastal area have complained of pollution and reported that locally-caught fish taste oily (Pabou-M'Baki, 1999). Domestic sewage and agricultural effluents also contribute to marine pollution in Central Africa as the rates of urban and industrial development in the coastal areas overwhelm municipal wastewater treatment facilities.

Water and sanitation

Unclean water and a lack of basic sanitation are undermining efforts to end extreme poverty and disease in Central Africa. While the indicators for access to safe drinking water have improved, progress is primarily seen in urban areas. At least 50% of the population from all countries in the region (with the exception of Equatorial Guinea) had access to an improved drinking water source in 2015. The country with the highest access to an improved water source was Gabon at 93%, followed by Cameroon and Congo at 76% each. Improved drinking water coverage for Central African Republic, Chad, Democratic Republic of Congo and Madagascar ranged from 51%-68%. Overall, the sub-region faces great disparities in improved water access, with limited improved drinking water access in the rural areas compared to urban areas.

With the exception of Equatorial Guinea at 75%, improved basic sanitation coverage was very low in the sub-region, with a low of 12% in Chad and Madagascar, 22% in Central African Republic, 29% in Democratic Republic of Congo, 42% in Gabon and 46% in Cameroon (UNICEF-WHO, 2015). Together, unclean water and poor sanitation are a leading cause of child mortality. An estimated 1,000 children die every day from diarrhea, spread through poor sanitation and hygiene.

3 REGIONAL CHAPTERS

CENTRAL AFRICA'S SUSTAINABLE DEVELOPMENT PRIORITIES

Sustainable development priorities	Priority actions
1. Promote good governance, rule of law, transparency and accountability	1.1 **Good governance.** Promote legitimate, accountable, and effective ways of obtaining and using public power and resources in the pursuit of widely-accepted social goals. 1.2 **Rule of law.** Encourage frank, broad-based assessment of representation, civil society, social support and compliance with policy, and clear institutional standards and enforcement. 1.3 **Transparency.** Generate public education and participation, and open and understandable rules, procedures and information by institutions. Reduce corruption through better use of public resources and effective public policy. 1.4 **Accountability.** Respect public opinion, consultation, evaluation of government and its responsibility. Strengthen checks and balances by institutions. 1.5 **Institutional capacity.** Drive strong, balanced institutions, that carry out efficient checks and balances (inclusive of civil society and the media) on peace and security to improve country risk ratings and attractiveness to investors.
2. Improve physical infrastructure for transportation, energy, ICTs, mining, water and sanitation	2.1 **Regional integration.** This will lower the cost of infrastructural development by giving smaller countries access to more efficient technologies and larger-scale production. For example, some countries have power systems that are too small to be able to generate power efficiently. Regional cooperation on infrastructure will harness and share the benefits of trans-boundary commons, such as river basins shared by two or more countries, through careful coordination of water resource management and associated infrastructure investments. 2.2 **Access to adequate internal & external finance.** Closing Central Africa's infrastructure financing gap requires additional funding and an improvement in the efficiency with which existing resources are used. Poor maintenance, inefficient distribution networks, failures in revenue collection, the under-pricing of services, and low capital budget execution all lead to substantial wastage of resources currently available for infrastructure development. Thus, bridging the sub-region's infrastructure funding gap is as much about improving the performance of the relevant institutions as it is about raising additional finance.

CENTRAL AFRICA

3

Sustainable development priorities	Priority actions
3. Promote peace, security and socio-political stability	3.1 **Conflict prevention and peace making.** Central Africa should use diplomacy and mediation to help countries prevent and resolve conflicts peacefully, while maintaining independence, impartiality and integrity, to prevent international disputes from arising, escalating or spreading. 3.2 **Peacebuilding.** Central African Countries should focus on efforts to reduce a country's risk of lapsing or relapsing into conflict by strengthening national capacities for conflict management, and laying the foundations for sustainable peace and development. 3.3 **Women, peace and security.** While women remain a minority among perpetrators of war, they increasingly suffer the greatest harm. Including women and women's perspectives in decision-making can strengthen prospects for sustainable peace.

Girls attending school in Central African Republic. Photo © Pierre Holtz for UNICEF.

CASE STUDY – CENTRAL AFRICA

ADDRESSING THE ENERGY CHALLENGES IN CENTRAL AFRICA

The Grand Inga is the world's largest hydropower scheme that is being developed on the Congo River in the Democratic Republic of Congo (DRC). The massive dam project forms part of a vision by the international community to develop a power grid across Africa, which will drive the continent's industrial economic development. The project is projected to cost $80 billion.

Grand Inga's proposed series of dams could produce up to 40,000 MW of electricity, which equates to more than a third of the total electricity currently produced in Africa.

The potential environmental and social impacts of large dams are multi-fold. However, the already operational Inga I and Inga II projects managed to avoid most of these due to the course of river design and nature of the site.

Grand Inga is considered a priority project of the Southern Africa Development Community (SADC), the New Partnership for African Development (NEPAD), South African Power Pool (SAPP) and the World Energy Council. Plans for the construction of Inga 3 BC (4,800 MW), the first phase of the Grand Inga, are at an advanced stage. It is planned that the power generated will be exported to South Africa, and will cater to mining companies in the southeast of the Democratic Republic of Congo.

Generally, the operational Inga I and II are considered to be highly positive examples of clean energy production. In addition to the environmental impact of the dam itself, the impact of Inga III largely depends upon the impact of the associated transmission lines.

THE WORLD'S LARGEST HYDROPOWER SCHEME

40,000 MW of electricity

1/3 of total electricity produced in Africa

project cost **$80** billion

CENTRAL AFRICA

3

PIDA PROJECTS – CENTRAL AFRICA

Project	Description	Cost ($ millions)	Stage	Countries	REC
ENERGY SECTOR					
Inga III Hydro	4,200 MW capacity hydropower scheme on the Congo River with eight turbines	6,000	S2	DRC	ECCAS
Central African Interconnection	3,800 km power line from DRC to South Africa through Angola, Gabon and Namibia, and to the north to Equatorial Guinea, Cameroon and Chad	10,500	S1	South Africa, Angola, Gabon, Namibia, Ethiopia	ECCAS
TRANSPORT SECTOR					
Pointe Noire, Brazzaville/ Kinshasa, Bangui, N'djamena Multimodal Corridor	Multimodal program to resuscitate river transport in the Congo-Ubangi River Basin and modernize road transport along the corridor	300	S3/S4	Republic of Congo, DRC, Central African Republic	ECCAS
Kinshasa-Brazzaville Bridge Road and Rail Project & Rail to Ilebo	Construction of a combined road and rail bridge over the Congo River to link Kinshasa to Brazzaville, and linking up with the existing Lubumbashi-Ilebo railway line	1,650	S2	Republic of Congo, DRC	ECCAS
Douala-Bangui Douala-Ndjamena Corridor	Modernizing the highest priority multimodal regional transport corridor in Central Africa and facilitating travel for people and goods between Cameroon, Chad and the Central African Republic	290	S3	Cameroon, Central African Republic, Chad	ECCAS
Central African Inter-Capita Connectivity	Construction of missing links on key inter-capital connector roads in Central Africa	800	S2	Cameroon, Central African Republic, Congo, DRC, Gabon, Burundi, Angola	ECCAS
Central Africa Air Transport	This program aims at increasing the air transport service levels and improving airports in Central Africa, which are currently limited due to the lack of regional air hub	420	S1	Angola, Burundi, Cameroon, the Central African Republic, Chad, the Republic of Congo, the Democratic Republic of Congo (DRC), Equatorial Guinea, Gabon and Sao Tome and Principe	ECCAS
Central Africa Hub Port and Rail Programme	Responding to future capacity problems in Central African ports by (a) generating a regional hub port and rail linkage master plan and (b) expanding the ports	1,400	S1	Cameroon, Chad, Central African Republic, Congo, DRC, Gabon, Burundi	ECCAS
WATER RESOURCES SECTOR					
Palambo Multipurpose Dam	Regulation dam to improve navigability of Obangui River with added hydropower component	155	S2	Republic of Congo, DRC, Central African Republic	ECCAS

3 REGIONAL CHAPTERS

EAST AFRICA

1. Burundi
2. Comoros
3. Djibouti
4. Eritrea
5. Ethiopia
6. Kenya
7. Rwanda
8. Seychelles
9. Somalia
10. South Sudan
11. Sudan
12. Tanzania (United Republic of)
13. Uganda

The East Africa sub-region comprises 13 countries situated in the Great Lakes region, the Horn of Africa and the Indian Ocean islands. They are: Burundi, the Comoros, Djibouti, Ethiopia, Eritrea, Kenya, Rwanda, Seychelles, Somalia, Sudan, South Sudan, the United Republic of Tanzania and Uganda. These countries have further clustered to enhance trade and economic development, through the following: Common Market for Eastern and Southern Africa (COMESA), East African Community (EAC) and Intergovernmental Authority on Development (IGAD) (UNECA, 2013).

East Africa's population has rapidly increased over the last 30 years, and is relatively young: it accounts for 28% of Africa's population, and half of its inhabitants are under 25. The population is expected to rise from the current 331 million to over 482 million by 2030. Ethiopia is the most populated country in the East Africa region with 99.4 million people, followed by the United Republic of Tanzania, with 53.5 million people (UNDESA, 2014).

I. ECONOMIC SUSTAINABILITY

Economic growth

Despite the global financial crisis, East Africa registered impressive economic growth over the past two decades. While the sub-region's economic growth declined from 6.7% in 2010 to 3.8% in 2012, it steadily recovered with 6% growth in 2013 and 2014. Ethiopia recorded the highest real GDP growth of 10.3% in 2014, following a decline to 8.6% in 2013. South Sudan recorded the highest growth of 13.1% in 2013, despite a sharp downturn and economic contraction (-46.1%) in 2012 due to conflict and declines in national oil production (AfDB, 2015). Comoros faced a serious energy crisis, which hampered economic growth resulting in a continued moderate growth from 3% in 2012 to 3.5% in 2013, and 2.1% decline in 2014.

EAST AFRICA

3

Djibouti's economic growth accelerated from 4.8% in 2012 to 6% in 2014. Eritrea contributed the least in GDP to the sub-region in 2013 and 2014, despite experiencing increasing growth within the period (from 1.3% to 2%) due to increased investments in the mining sector. Seychelles' economy suffered a downturn in growth from 6.6% in 2013 to 3.3% in 2014, due to the poor performance of the tourism and manufacturing sectors. The United Republic of Tanzania's economy grew by 7.3% in 2013 and 7.4% in 2014 due to a strong performance in most sectors and supported by public investment in infrastructure. Similarly, the Ugandan economic growth grew to 4.8% in 2014, due to an increase in public investments in infrastructure, a recovery of private domestic consumption and investment demand, and a rebound in agriculture, despite a reduction in growth to 3.3% in 2013 (World Bank, 2014). While there is no available GDP data for Somalia, the base of its economy is narrow as the majority of the population is nomadic yet dependent on livestock and livestock exports for livelihoods.

Woman feeding fish in Kenya.

3 REGIONAL CHAPTERS

EAST AFRICA

ECONOMY GROWTH AND SIZE, POPULATION – CURRENT AND 2030 PROJECTION

Country	Real GDP growth (%) (a)					GDP Contribution to Region 2014 (%) (a)	Total Population (b)	
	2010	2011	2012	2013	2014		2015 (million)	2030 Projection (million)
Burundi	3.8	4.2	4	4.6	4.7	1.1	11.2	17.4
Comoros	2.2	2.6	3	3.5	2.1	0.3	0.8	1.1
Djibouti	3.5	4.5	4.8	5	6	0.7	0.9	1.1
Eritrea	2.2	8.7	-	1.3	2	-	5.2	7.3
Ethiopia	12.6	11.2	8.6	10.6	10.3	19.9	99.4	138.3
Kenya	8.4	6.1	4.6	5.7	5.3	19.2	46.1	65.4
Rwanda	7.3	7.9	8.8	4.7	7	3.3	11.6	15.8
Seychelles	5.9	7.9	6	6.6	3.3	0.9	0.1	0.1
Somalia	-	-	-	-	-	-	10.8	16.5
South Sudan	5.5	-4.6	-46.1	13.1	3.4	-	12.3	17.8
Sudan	3.5	-2	-2.2	3.3	3.1	24.8	40.2	56.4
Tanzania	6.4	7.9	5.1	7.3	7	19.2	53.5	82.9
Uganda	5.2	9.7	4.4	3.3	4.8	10.7	39	61.9
East Africa*	6.7	5.5	3.8	6.0	6.0	100	331.1	482

Source: (a) World Bank (b) UN Population Division Department of Economic and Social Affairs (-) missing data (*) based on authors' calculations.

EAST AFRICA

3

School girls in Kenya.

With the exception of Eritrea, Somalia and South Sudan, East Africa contributed 15% of sub-Saharan Africa's GDP in 2014. Sudan provided the highest share in the sub-region (24.8%), followed by Ethiopia (19.9%), Kenya (19.2%), Tanzania (19.2%), Uganda (10.7%), Rwanda (3.3%), Burundi (1.1%), Seychelles (0.9%) and Djibouti (0.7%). Comoros was the smallest contributor to the sub-region's GDP, representing 0.3% (World Bank, 2014).

The majority of people in East Africa depend on agriculture for all or part of their livelihood. Based on this premise, fostering sustainable agricultural growth will boost income and improve the living conditions for the population, the majority of whom are poor.

Many young people have few or no skills and are therefore largely excluded from productive economic and social life (African Economic Outlook, 2016). With the exception of Djibouti, Seychelles and South Sudan (due to missing data), Sudan has the highest unemployment rates in the sub-region, estimated at 14.8% in 2014, having increased from 14.6% in 2010. Kenya follows Ethiopia with unemployment at 9.2%. Unemployment in Burundi remains high: 6.9% in 2014, despite a reduction from 7.1 % in 2010.

2014 unemployment rates were 6.5% in Comoros, 6.9% in Somalia, and 5.2% in Ethiopia. Rwanda had the lowest unemployment rates in the sub-region at 0.6%, followed by Tanzania at 3.1% and Uganda at 3.8% (World Bank, 2016).

Poverty

While East Africa has made modest strides in reducing poverty levels, the poverty rates are still high, affecting 40% or 120 million of the 2014 population, most of whom live in rural areas. Overall, the pace of poverty reduction in the sub-region has slowed since the 1970s (World Bank, 2009) with variations among countries.

Burundi has the highest proportion of its population (81.3%) living on less than $1.25 a day, followed by Comoros (46.1%). According to projections based on current trends, the proportion of the population living below $1.25 a day will increase 46% by 2030 (UNDP-HDI, 2015).

3 REGIONAL CHAPTERS

EAST AFRICA

POVERTY LEVELS - CURRENT AND 2030 PROJECTION

Country	Population living on below $1.25 PPP per day		
	(%) 2002-2012 (a)	2002-2012 (million) (b)	2030 (million) (b)
Comoros	46.1	0.4	0.5
Djibouti	18.8	0.2	0.2
Eritrea	-	-	-
Ethiopia	36.8	36.6	50.9
Kenya	43.4	20.0	28.4
Rwanda	63	7.3	10.0
Seychelles	-	-	-
Somalia	-	-	-
South Sudan	-	-	-
Sudan	19.8	8.0	11.2
Tanzania	43.5	23.3	36.1
Uganda	37.8	14.7	23.4
East Africa*	40	119.5	174.7

Source: (a) UNDP HDI 2015 (b) Estimated based on UNDP HDI 2014 Population (-) missing data (*) based on authors' calculations.

Food security in East Africa has worsened in the past five years. Maize is the most important staple food, followed by cassava, sorghum, teff, wheat, plantains, and sweet potato. These foods contribute 50-75% of the calorific intake of the population (COMESA, 2010). While cereal production in sub Saharan Africa has tripled, from 38 million tons in 1961-1963 to 116 million tons in 2008-2010, the sub-region still faces food insecurity (AfHDR, 2012).

With the exception of Seychelles (due to 2014 missing data), the average cereal yield production per hectare for East Africa was 1.5 tonnes. However, Eritrea (0.6 tonnes), Somalia (0.7 tonnes) and Sudan (0.7 tonnes) fell well below the sub-regional average. Burundi, Comoros and South Sudan were also below the sub-regional average.

Rwanda registered a slight decline in cereal yield per hectare from 2.1 tonnes in 2011 to 1.9 tonnes in 2014.

EAST AFRICA

Similarly, Ethiopia's cereal production per hectare increased from two tonnes in 2011 to 2.3 tonnes in 2014.

Given the sub-region's current food production trend in relation to the rising population, food insecurity is a great concern in the sub-region. Food insecurity has been induced by a number of factors, including: constrained food production due to climatic conditions such as drought or floods, and urban migration; insufficient food production, and a rise in the local food prices (FAO, 2014).

Djibouti and Eritrea suffer widespread lack of access to food, while Burundi, Ethiopia, Kenya, Somalia, South Sudan are faced with severe localized food insecurity (FAO, 2012).

To cope with insufficient food, countries rely on food imports or food aid from humanitarian organizations. The food security situation in some countries has been aggravated by the importation of manufactured food commodities, which are subject to high price fluctuations, further increasing the risk of food shortages.

Infrastructure and energy

Central Africa is faced with inadequate and inefficient mobility of people and goods, thus stagnating socio-economic progress. Traffic jams and congestion in East African cities and accident fatalities on all modes of transport greatly contribute to high operating costs and the loss of life and property.

Since gaining independence, most countries in the region have added little or nothing to their existing railway lines; only 8% of goods are transported by rail. Road transport is hampered by long transit periods, due to poor or dilapidated surfaces and insecurity. Land locked countries in East Africa are affected greatly by long waiting periods at ports and borders.

The burden of poor or inadequate infrastructure is still a major constraint to regional integration and development: transport costs are estimated to add as much as 30% to the cost of imports and exports in the sub-region. For example, in 2012, it cost approximately $2,000 to ship a 20-foot container by sea from China to Mombasa in Kenya, a distance of almost 9,500 kilometres. Transporting that same container from Mombasa to Kigali in Rwanda, only 1,700 km over land, cost around $4,650. These high costs exist in spite of the fact that both countries are members of the same economic bloc, the East African Community (EAC). 25% and 33% of Ugandan and Burundi GDP transit through Kenya. It is imperative to create affordable and efficient transport corridors for the landlocked countries in East Africa (Kourouma, 2010).

The sub-region has adopted the Programme for Development projects in Africa (PIDA) since 2012. Means to address issues concerning supply and proper management of infrastructure are now being embedded in the bloc's policies, which in itself enhances regional integration. The coordinated development programs include: Northern Multimodal Corridor ($1 billion), North-South Multimodal Corridor ($2.3 billion), Djibouti Addis Corridor ($1 billion), Central Corridor ($840) million and Lamu Gateway Development ($5.9 billion). These, in turn, will facilitate the movement of goods and enable the establishment of intra-regional trade.

The predominant source of energy in East Africa is biomass, mainly firewood and charcoal, whose use has exacerbated land degradation, put strain on biomass energy and resulted in low agricultural productivity. Only 22.7% of the population has access to electricity, with particularly low access in rural areas. With the exception of Seychelles, Djibouti and Comoros, the percentage of people with access to electricity in the sub-region is below 36.2% and as low as 6.5% for Burundi. While Seychelles' population has 100% access to electricity, only 17.3% of the country's rural population has access to electricity (World Bank, 2012).

3 REGIONAL CHAPTERS

EAST AFRICA

ENERGY ACCESS

Source: World Bank, 2012

Oil and gas are alternate energy sources in the sub-region, with South Sudan being the current main producer. Uganda and Kenya have since discovered oil and gas deposits of commercial quantities. Offshore exploration for oil and gas is ongoing in Djibouti, Eritrea, Kenya and Somalia.

The current oil and gas discoveries are likely to have profound effects on the economy, the environment, and peace and security within the sub-region. To address this, East Africa has embarked on various large-scale hydropower and petroleum projects, which will lead to a substantial increase in energy capacity. These include: The Great Millennium Renaissance Dam in Ethiopia ($8 billion), Ruzizi III hydroelectric power plant ($450 million), Rusumo Falls hydropower plant ($360 million) and the Uganda-Kenya Petroleum Products pipeline ($150 million).

Mobile cellular subscriptions in East Africa stand at 52 connections per 100 people on average, with the highest number of connections in the Seychelles and the lowest, just 6 per 100, in Eritrea. Mobile cellular subscriptions in Burundi, Djibouti, Ethiopia and South Sudan are below 33 per 100, while the other countries range between 51 and 74.

Internet use is low in East Africa: Seychelles has the highest number of users (54.3% of the population), followed by Kenya (43.4%). The lowest is in Burundi, where 1.4% uses the internet (World Bank, 2014).

Nairobi in Kenya – sometimes referred to as the 'Silicon Savannah' – has been the epicenter of developments in mobile technology. It has driven innovations in mobile money, such as M-Pesa, and crowdsourcing, such as Ushahidi.

Mobile subscriptions and internet growth has been limited by the relatively weak business case for rural network rollout, which makes it hard to justify the high costs of network deployment and maintenance in remote communities.

II. SOCIAL INCLUSION

East Africa scored a low Human Development Index (HDI) rating of 0.499, compared to sub-Saharan Africa's average of 0.518, and the world average of 0.711 in 2014. Seychelles was categorized as 'high' in terms of HDI and ranked 64th globally, but the other countries in East Africa were categorized as 'low'. Burundi had the lowest HDI score of 184th. Despite improvements as a result of lower maternal and child mortality, the sub-region is still faced with social challenges (UNDP-HDI, 2015).

EAST AFRICA

3

Health

East Africa made remarkable progress towards the health-related MDGs goals and targets for child mortality, HIV, tuberculosis and malaria. Under-five child mortality dropped from 78.6 per 1,000 live births in 2010 to 64.3 in 2015. Child mortality fell significantly between 2010 and 2015 in the following countries: Rwanda (64 to 42), Eritrea (56 to 47), Tanzania (63 to 49), Kenya (62 to 49) and Uganda (75 to 55). Despite these improvements, the sub-region still fell short of the MDG targets (World Bank, 2015).

HEALTH INDICATORS

Country	Under five mortality (per 1,000 live births) 2015	Life expectancy at birth, total (years) 2014	Prevalence of undernourishment (% of population) 2014	Adolescent fertility (births per 1,000 women ages 15-19) 2014	Tuberculosis (per 100,000 people) 2014	HIV prevalence, adults (% ages 15–49) 2014
Burundi	82	57	-	29	126	1.1
Comoros	74	63	-	70	35	-
Djibouti	65	62	16	22	619	1.6
Eritrea	47	64	-	56	78	0.7
Ethiopia	59	64	32	60	207	1.2
Kenya	49	62	21	92	246	5.3
Rwanda	42	64	32	27	63	2.8
Seychelles	14	73	-	58	26	-
Somalia	137	55	-	105	274	0.5
South Sudan	93	56	-	68	146	2.7
Sudan	70	63	-	76	94	0.2
Tanzania	49	65	32	119	327	5.3
Uganda	55	58	26	115	161	7.3
East Africa*	64.3	62	21.9	69	184.8	3.9

Source: World Bank Development indicators, 2016; (-) missing data (*) based on author´s calculation.

3 REGIONAL CHAPTERS

EAST AFRICA

People in East Africa are now living longer, with a life expectancy of 62 years in 2014, from 60 years in 2010. Seychelles has the highest life expectancy at 73, while Somalia has the lowest at 55, followed by Sudan at 56 years (World Bank, 2014).

A significant proportion of the population is unable to meet minimum dietary requirements and undernourishment is still prevalent. Undernourishment remains high in Ethiopia (32%), Rwanda (32%), Tanzania (32%), Kenya (31%), Uganda (26%) and Djibouti (16%) (World Bank, 2014). Overall gains in food consumption in several countries will not be sufficient to reduce the number of undernourished people (FAO, 2006).

Fertility rates in East Africa declined to 4.6 children per woman in 2014, from 4.9 children per woman in 2010. The adolescent fertility rate for women aged 15-19 per 1,000 women reduced to 69 in 2014, from 79 in 2010 (World Bank, 2014). 2014 adolescent fertility rates were highest in Tanzania (119 per 1,000 women), Uganda (115), Somalia (105) and Kenya (92). Despite an increase in the use of contraception for birth control, fertility rates in East Africa are still the highest on the continent.

National governments and development partners have had success in reducing the spread of HIV in East Africa. With the exception of Seychelles and Comoros (due to missing data) and Uganda, the number of new HIV infections per year dropped. Reductions ranged from 4% in South Sudan to 31% in Burundi. HIV prevalence is highest in Uganda among adults aged 15-49. Prevalence increased in Uganda from 6.9% in 2013 to 7.3 in 2014.

Despite progress, the percentage of people living with HIV who received antiretroviral therapy remained very low in 2014: 68% in Rwanda, 55% in Kenya, 50% in Uganda, 50% in Ethiopia, 49% in Eritrea, 43% in Tanzania, 44% in Burundi, 16% in Djibouti and, in Somalia, South Sudan and Sudan, just 5%, 6% and 7% respectively (World Bank 2014).

Alongside declining rates of HIV, the incidence of TB has declined as well (WHO, 2008). The incidence of tuberculosis (per 100,000 people) between 2010 and 2014 fell in Djibouti (620 to 619), Tanzania (426 to 327), Somalia (286 to 274) and Kenya (299 to 246) (World Bank 2014). Unless HIV/TB incidence is significantly reduced, there will remain a gap between new HIV/TB infections and access to treatment, due to limited financial resources.

Malaria is the leading cause of death in children under 5 years. Yet, 90% of malaria-related deaths are preventable and treatable. Malaria prevention and treatment is relatively cost effective, although limited by the capacity of health services and public health policies.

Only Seychelles has 15 physicians per 10,000 inhabitants, and thus reaches the global standard of 14 physicians per 10,000 inhabitants. Most countries in the sub-region have a physician density of 0.5 or 1 per 10,000. In 2000, the Eritrea government mounted efforts to control malaria and, as a result, witnessed an 80% drop in reported malaria cases and an 85% decline in malaria deaths (UNECA, 2013).

While HIV, Malaria and TB will remain predominant health challenges in the sub-region in the coming decade, the burden of chronic non-communicable diseases such as cancer, diabetes, cardio-vascular conditions and hypertension are expected to rise, particularly in urban areas. This rise is attributed primarily to diet changes, sedimentary lifestyle choices, and alcohol and tobacco consumption.

With the exception of Seychelles (due to missing data), the number of deaths due to non-communicable diseases in 2012 (as a percentage of the total) was highest in Comoros (38%) followed by Eritrea (37%), Djibouti (36%), Rwanda (36%), Sudan (34%), Tanzania (31%), Burundi (28%), Uganda (27%), Kenya (27%), South Sudan (26%) and Somalia (19%) (World Bank, 2012). Non-communicable diseases have been neglected to date; currently, as much as 80% of national health budgets address communicable disease.

EAST AFRICA

3

Children play in the street in Western Region, Uganda. Photo © Gordon C. Shaw / SDGC Africa.

3 REGIONAL CHAPTERS

EAST AFRICA

Education

East African nations have made progress in increasing primary school enrollment in the past two decades, through programs like Universal Primary Education (UPE). But the number of pupils transitioning to secondary and tertiary education is still low. The average years of schooling were 4.8 in 2014, about half of the 9.3 expected years of schooling within the sub-region. Ethiopia registered the fewest mean years of schooling (2.4 years) in relation to the expected number of years (8.5) (UNDP, 2015).

Overall, youth literacy rates are still low considering that countries were due to achieve 100% literacy among 15-24 year olds by 2015. With the exception of Djibouti (due to missing data), only 44.3% of the youth (15 to 24 years) in South Sudan and 69.4% in Ethiopia were literate. Other countries in East Africa, however, had youth literacy rates above 80% (UNESCO, 2015).

The primary enrollment rate was over 100% in Burundi, Comoros, Kenya, Rwanda, Seychelles and Uganda, as a result of pupils repeating years and starting school late, staying on well past primary school age. The primary enrollment for the other countries ranged from 51% to 100%.

Transition to secondary education from primary education is a clear concern: the secondary enrollment ranges from 28% in Uganda to 75% in Seychelles. Tertiary enrollment is even lower, ranging from 2.6% in Eritrea to 7.5% in Rwanda.

Access to schooling, and the quality of that schooling, has continued to suffer due to limited learning resources, teacher shortages and absenteeism, the distance children must travel to and from school, and the insecurity they can face. Adequate funding is critical if countries are to attain the education-related SDGs and public expenditure on education is to be raised to 20% of the national budget, as planned.

Gender and inequality

East Africa has made modest progress by increasing the percentage of seats held by women in national parliaments from an average of 26 in 2011, to 30 in 2015 (World bank, 2015). Rwanda had the highest number of women in parliament in 2015 (64) while Comoros had the fewest (3). Countries in the sub-region, however, have high Gender Inequality Indices (GII), ranging from 0.4 for Rwanda to 0.591 for South Sudan (UNDP HDI 2015), indicating great disparities in terms of quality of life for men and women.

III. ENVIRONMENTAL SUSTAINABILITY

The East African economy relies on primary activities linked to natural resources. Coupled with the growing population, the expanding economy is thus placing ever greater demands on land, water, forests, minerals, and energy resources.

Climate change

Economic consequences of land degradation are severe in East Africa. About 65% of the population is rural, with approximately 90% relying on agriculture for livelihoods (NEPAD, 2013). Natural disasters affected nearly 466,002 per million people per annum between 2005 and 2014. Between 1990 and 2012, the sub-region lost at least 20,588,000 hectares of forest, which equates to 1,029,400 hectares of forest every year - approximately four times the global average. The amount of forest is decreasing at an alarming rate.

For example, the total forest area in the Comoros, 120 km^2, gradually reduced to 80 in 2000, then to 50 km^2 in 2005, a loss of 70 km^2 (more than 50%) in only fifteen years. By 2012, Comoros had a forest cover of only 1.2% of what it was, registering an 81.7% loss between 1990 and 2012.

EAST AFRICA

3

Similarly, Burundi had 2,890 km² of forest coverage, which had fallen to 1,980 km² by 2005. Uganda and Burundi equally suffered forest losses of 40.8% and 41.7% between 1990 and 2012 respectively. The only country in the sub-region to increase its forest coverage was Rwanda, with a 43.1% increase in 2012. Djibouti and Seychelles have maintained their forest coverage since 2000 (UNDP, 2015).

There has been a general increase in mean temperature in the sub-region since 1970, with an increase of between 0.5-1°C, and, for 15% of the sub-region, an increase of more than 1°C. Precipitation has also increased in some parts since the early 1970s, although the mean seasonal rainfall is still below the long-term average of the period 1900 to 2009. East Africa is home to thousands of pastoralists who tend to their livestock on the semi-arid to arid lands. In 2011, some 13 million people in Djibouti, Eritrea, Ethiopia, Kenya and Somalia experienced one of the worst humanitarian crises in decades: the sub-region's most severe drought in 60 years caused widespread starvation and made access to clean water and sanitation extremely difficult (UNEP, 2012).

Measures to regulate air pollution, especially in urban centers and industrial areas, should be a priority. Countries should prioritise mitigating air pollution through policy changes such as: phasing out leaded fuel; use of reduced-sulfur fuel; initial testing of natural gas in vehicles, and restricting the importation of old vehicles as Eritrea, Tanzania and Kenya have done (WWF, 2015). On the other hand, over 80% of marine pollution comes from land-based activities. Marine pollutants in the form of pesticides, herbicides, chemical fertilizers, detergents, oil, sewage, plastics, and other solids are now a growing threat to water resources in most countries. These pollutants collect at the ocean's depths, where they are consumed by small marine organisms and introduced into the global food chain.

The Indian Ocean Experiment (INDOEX) revealed atmospheric pollution covering some 10 million km² of the Indian Ocean, primarily the result of human waste disposal. The Indian Ocean is considered the third major collection of plastic garbage in the world's oceans (Coastal care, 2015).

Water and sanitation

Despite improvements in access to safe water and improved sanitation from 1990 to 2015, the sub-region still lags behind. At least 50% of the population from all countries in East Africa (with the exception of Somalia) had access to an improved drinking water source in 2015, with the highest coverage in Seychelles (96%), followed by Comoros and Djibouti, with 90% each. Improved drinking water coverage for Tanzania, Ethiopia, Eritrea and South Sudan ranged between 52%-59% while Rwanda, Burundi and Uganda had improved drinking water coverage of between 76%-79%. Overall, the sub-region faces great disparities in improved water access, with limited access in the rural areas when compared to urban areas.

With the exception of Seychelles at 98%, improvements in sanitation coverage were minimal in the sub-region, with a low of 7% with access to improved sanitation in South Sudan, 16% in Eritrea, 16% in Tanzania, 19% in Uganda, 28% in Ethiopia, 30% in Kenya, 36% in Comoros, 47% in Djibouti, 48% in Burundi and 62% in Rwanda (WHO/UNICEF, 2015). Together, unclean water and poor sanitation are a leading cause of child mortality in East Africa.

3 REGIONAL CHAPTERS

EAST AFRICA

EAST AFRICA'S SUSTAINABLE DEVELOPMENT PRIORITIES

Sustainable development priorities	Priority actions
1. Achieve sustainable and inclusive growth and economic transformation.	1.1 **Infrastructure development.** The improvement of East Africa's trans-boundary infrastructure will offer potential for growth. The sub-region should focus on expanding electrical grids, schools, hospitals, water sources, roads, railways, air transport and communications. These systems allow for the more efficient production and transportation of goods, allowing for an increased economic output. Additionally, the sub-region should work on clean water and sanitation systems, which will result in improved public health. 1.2 **Education, skills development & industrialization.** East Africa must invest in the skills of its people, reduce illiteracy rates and revamp the current education systems to suit the current job market. In addition, industrialization through the creation of small and medium enterprises will create more jobs. Agricultural mechanization, using appropriate technology, will boost food supply.. 1.3 **Address a growing population.** In order to attain sustainable economic growth in the sub-region, East African nations should advocate for the use of family planning services. By reducing the number of births per woman, the overall GDP per capita will rise, resulting in a higher standard of living for all citizens.
2. Achieve a healthy and productive population.	2.1 **Inclusive health.** East African countries should put more emphasis on reducing non-communicable diseases and injuries, in addition to the already existent programs that address communicable diseases such as HIV/AIDS, Malaria, etc. Health sector investments should be increased across the board, especially in health data-capturing systems, including: birth and death registration (with cause of death), health facility and community health information systems, and administrative data on health infrastructure, workforce and financing. Countries should develop the technical capacity to conduct health inequality analysis and establish reporting practices that effectively communicate clear messages facilitating action. 2.2 **Reduce health sector inequalities.** East Africa countries should reduce health inequality through monitoring systems, financial resources, advocacy and technical expertise. Reducing health inequality requires the engagement of a diverse range of partners, including ministries of health, national statistical offices and other relevant sectors of governments, United Nations agencies, funding agencies, academic institutions, civil society organizations and the private sector. Building a multidisciplinary network of experts in the area of health inequality monitoring with diverse strengths and perspectives will foster the development of expertise to tackle health inequity.

EAST AFRICA

3

Sustainable development priorities	Priority actions
3. Promote peace, security and socio-political stability.	3.1 **Adaption to climate change.** East African nations should enforce environmental and animal protection laws, promote agro-ecological approaches to farming, and support smallholders farmers to improve soil and water management techniques via outreach extension services. Reforestation schemes must be strengthened in order to regulate fossil fuels intensive energy sources, and energy efficiency policies and decentralized off-grid renewable energy should be introduced. 3.2 **Sustainable conservation of eco systems and bio diversity.** East Africa countries should integrate sustainable natural resources management by strengthening their existing policies and adapting appropriate sustainable reforms. Countries should review their land and water management policies and suggest appropriate reforms.

Eye care day in Uganda has improved the sight of hundreds of villagers.

CASE STUDY – EAST AFRICA

THE STANDARD GAUGE RAILWAY (SGR), A GAME CHANGER IN EAST AFRICA

The East African Railway Master Plan will rejuvenate the existing railways in Tanzania, Kenya, Uganda and extend them, initially to Rwanda and Burundi and eventually to South Sudan, Ethiopia and beyond. The plan will be managed by infrastructure ministers of the participating East African Community countries in association with transport consultation firms. The central corridor standard gauge 2,561km railway (SGR) will link the East African region with the port of Dar es Salaam.

The railway will begin at the port of Dar es Salaam and serve the landlocked countries of Zambia, Rwanda, Burundi, Uganda and the eastern Democratic Republic of Congo. It will have spur lines to Kigali-Rwanda, Bujumbura-Burundi and Masaka-Uganda. Not all of the planned routes will be built as part of the development. The project has faced some challenges and delays, but construction is underway. The first 472km of the Standard Gauge line in Kenya opened in 2017, and 2018 is proposed as the year of completion for the rest.

The coastal country of Kenya is an import trade route for three landlocked countries, Uganda, Rwanda and Burundi, so transport infrastructure in Kenya has a significant impact on its neighbours. Once complete, the SGR will be critical part of economic growth because it is uniquely able to move a large volume of goods efficiently, with little impact to the people and communities served. This will create efficient regional links, improve business within the sub-region, create jobs, and foster strong multilateral relationships. The SGR will also be up to three times more fuel-efficient than trucks, thus decreasing emissions.

EAST AFRICAN RAILWAY MASTERPLAN

2561 m standard gauge

link Rwanda, Burundi, Uganda, DRC, Kenya

expected to open **2018**

increase **jobs and business**
decrease **emissions**

EAST AFRICA

3

PIDA PROJECTS – EAST AFRICA

ENERGY SECTOR					
Project	Description	Cost ($ millions)	Stage	Countries	REC
Great Millennium Renaissance Dam	Develop a 5,250 MW plant to supply domestic market and report electricity on EAPP market	8,000	S4	Ethiopia, Nile Basin	COMESA/ IGAD
Batoka	Hydroelectric plant with a capacity of 1,600 MW to enable export of electricity	2,800	S3	Zambia, Zimbabwe Zambezi basin	COMESA/ EAC
Ruzizi III	Hydroelectric plant with a capacity of 145 MW to share power between Rwanda, Burundi and DRC	450	S3	Rwanda/DRC	COMESA/ EAC
Rusumo Falls	Hydropower production of 61 MW for Burundi, Rwanda and Tanzania	360	S3	Nile river Basin	COMESA/ EAC
Uganda-Kenya petroleum products pipeline	300 km long pipeline for a lower cost transport of petroleum products	150	S4	Uganda, Kenya	COMESA/ EAC
TRANSPORT SECTOR					
Northern Multimodal Corridor	A program to modernize the highest priority multimodal road corridor (including climbing lanes and urban bypasses) in East Africa. It aims to facilitate travel by people and goods across the borders between Kenya, Uganda, Rwanda, Burundi and DRC, with a spur to South Sudan	1,000	S3/S4	Kenya, Uganda, Rwanda, Burundi	COMESA/ EAC
North-South Multimodal Corridor	A program to modernize the highest priority multimodal ARTIN corridor in Southern Africa to modern standards and facilitate travel of people and goods across the borders between South Africa, Botswana, Zimbabwe, Zambia, Malawi and DRC	2,325	S3/S4	DRC, Zambia, Zimbabwe, South Africa, Mozambique	COMESA/ EAC/ SADC
Djibouti-Addis Corridor	The upgrading of 710 kilometres of railway and the roll-out of six smart corridor modules between Ethiopia and Djibouti to increase trade and transport links.	1,000	S3/S4	Djibouti, Ethiopia	COMESA/ IGAD
Central Corridor	Upgrading and modernization of roads in East Africa to facilitate travel for people and goods across the borders between Tanzania, Uganda, Rwanda, Burundi and DRC.	840	S3/S4	Tanzania, Uganda, Rwanda, Burundi, DRC	COMESA/ EAC
Beira-Nacala Multimodal Corridors	Implementation of a modern railway system between the ports of Nacala and/or Beira and the coal-exporting region of Moatize in Mozambique.	450	S3/S4	Mozambique, Malawi, Zimbabwe	COMESA/ SADC
Lamu Gateway Development	A project to develop sufficient port capacity in Lamu, Kenya, to handle future demand from both Kenya and land-locked countries in the EAC.	5,900	S3/S4	Kenya, Uganda, Rwanda, Burundi	COMESA/ SADC/ EAC

3 REGIONAL CHAPTERS

NORTH AFRICA

1. Algeria
2. Egypt
3. Libya
4. Mauritania
5. Morocco
6. Tunisia

North Africa is separated from the rest of the continent by the Sahara Desert. Six countries make up the northern region of Africa: Algeria, Egypt, Libya, Mauritania, Morocco and Tunisia. The majority of the region's territory is desert and, despite its challenging topography, North Africa is the most developed region of the continent. By cultural, religious and language standards, it can also be considered the most homogenous. In 2015, the population of the region accounted for 16% of the continent's population: 187.6 million, expected to rise to 231 million in 2030 (UNDESA, 2014). The most populated country is Egypt with 91.5 million people in 2015, and the least populated is Mauritania, with 4.1 million (UNDESA, 2014). The countries are clustered into two main regional economic blocks, the Arab Maghreb Union (AMU) and the Community of Sahel-Saharan States (CENSAD).

I. ECONOMIC SUSTAINABILITY

Economic growth

Despite the political and social turmoil that the region experienced in 2011, economies remained dynamic, primarily because of oil, mining, agriculture and tourism-related activities.

Average macroeconomic indicators for the region can be misleading given the great variance between its countries. For example, Algeria and Egypt represent nearly two thirds of the North African economy, contributing 30.9% and 30.7% respectively to the region's GDP in 2014, while Mauritania represented approximately 1% and Libya 6.8%.

NORTH AFRICA

3

North Africa grew on average 3.9% between 2010 and 2014, although Libya and Tunisia registered negative growth and Egypt and Morocco experienced stagnated growth within the same period. The region, despite being the most industrialized on the continent, registered average growth rates below those of the sub-Saharan Africa region, which on average grew 4.4% between 2010 and 2014.

In general, GDP growth rates were higher in 2010 than in 2014 for all the countries in North Africa, with the exception of Algeria and Mauritania, mirroring the economic slowdown experienced by the region as a result of political instability, sharp decreases on their terms of trade, and reduction of FDI (AfDB, 2015). Egypt's growth did not surpass 2.2% between 2011 and 2014, while Libya's economy contracted by 62.1% in 2011, expanded by 104.5% in 2012, and contracted again by 13.6% and 24% in 2013 and 2014 respectively. Morocco recorded a sharp decline in growth from 4.7% in 2012 to 2.4% in 2014; its average growth between 2010 and 2014 was 3.8%. Tunisia slowly recovered from the negative growth of -1.9% recorded in 2011, growing on average between 2010 and 2014 by 2.3%, while Mauritania registered the highest average growth rate in the same period of 5.4% (World Bank, 2014).

ECONOMY GROWTH AND SIZE AND POPULATION – CURRENT AND 2030 PROJECTION

Country	Real GDP growth (%) (a)					GDP Contribution to region 2014 (%) (a)	Total population (b)	
	2010	2011	2012	2013	2014		2015 (million)	2030 Projection (million)
Algeria	3.6	2.8	3.3	2.8	3.8	30.9	39.7	48.3
Egypt, Arab Rep.	5.1	1.8	2.2	2.1	2.2	30.7	91.5	117.1
Libya	5.0	-62.1	104.5	-13.6	-24.0	6.8	6.3	7.4
Mauritania	4.8	4.4	6.0	5.7	6.4	0.8	4.1	5.7
Morocco	3.8	5.2	3.0	4.7	2.4	20.5	34.4	39.8
Tunisia	3.5	-1.9	4.1	2.9	2.7	10.2	11.6	12.7
Sub-Saharan Africa	5.2	4.2	4.0	4.3	4.4	-	962.3	1396.9
North Africa (*)	**4.3**	**-1.1**	**13.7**	**1.5**	**1.0**	**100.0**	**187.6**	**231.0**

Source: (a) WB (b) UN Population Division, Department of Economic and Social Affairs (*) based on authors' calculations.

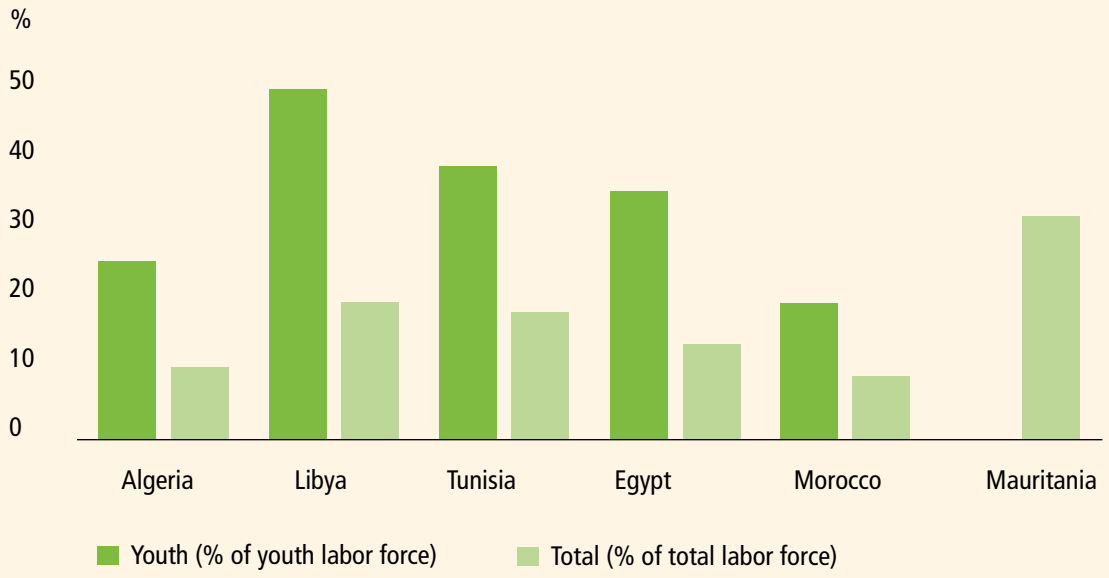
NORTH AFRICA

The region's economy is heavily reliant on natural resources, notably its vast oil, natural gas and mining reserves. The region's low economic diversification and high dependency on the extractive industries result in economies that are particularly vulnerable to volatile global commodities prices. This is due to their reliance on staple imports, which is remarkably high across the region (for example cereal imports, which account for 30% of cereals in Algeria, 52% in Egypt, 78% in Libya, 40% in Morocco and 90% in Mauritania (UNECA, 2013) (African Economic Outlook, 2016).

Despite the North African industrial sector being the most efficient on the continent, its high dependency on commodity exports and natural resource exploitation has resulted in undiversified economies. Oil and gas account for 57.7% of Algeria's and 86.8% of Libya's total exports; mining represents 60.7% of Libya's and 25.7% of Mauritania's economy (AfDB, 2015).

This lack of diversification creates economies unable to create enough employment for their populations. One of the region's main problems is structural high unemployment, which has been above 10% for the past two decades in the region and accounts for 9.8% in Algeria, 19% in Libya, 17.6% in Tunisia, 13.2% in Egypt, 9.2% in Morocco and 31.2% in Mauritania. This unemployment primarily impacts women and the youth. Women in the whole region are twice as likely to be unemployed in comparison to men, while youth unemployment is above 19% in all the countries (UNDP-HDI, 2015).

TOTAL UNEMPLOYMENT 2013



Source: UNDP-HDI, 2015.

NORTH AFRICA

3

Finally, the North African region has not yet succeeded in terms of economic, social and environmental integration. To date, its countries have not taken full advantage of the linkages between them and have not tapped potential markets and new supply sources. Trade between countries of the region represents less than 3% of their total volume of trade, which is the lowest level among all regional trade agreements registered with the World Trade Organization (AfDB, 2014).

Poverty

Poverty levels in North Africa have always been lower than among other regions of the continent but they have been constantly declining since 2000. Poverty is unevenly distributed. For instance, in Mauritania, the percentage of the population living below the $1.25 poverty line exceeds 20%, while in Egypt, Morocco and Tunisia, levels are below 3% (UNDP-HDI, 2015).

If poverty rates remain at current trends, the estimated population living on under $1.25 by 2030 will increase to 26.5 %, or 4.1 million. This will have a greater burden in the countries where population growth is the highest. For instance, in Mauritania, by 2030, there will be 400,000 more people living on less than $1.25.

POVERTY LEVELS - CURRENT AND 2030 PROJECTION

Country	Population living on below $1.25 PPP a day		
	(%) 2002-2012 (a)	2002-2012 (million) (b)	2030 (million) (b)
Egypt, Arab Rep.	1.7	1.4	1.7
Libya	-	-	-
Mauritania	23.4	0.9	1.3
Morocco	2.6	0.9	1.0
Tunisia	0.7	0.1	0.1
North Africa (*)	2.5	3.3	4.1

Source: (a) UNDP HDI 2015 (b) Estimates based on UNDP HDI 2014 Population (*) based on authors' calculations.

NORTH AFRICA

Infrastructure and energy

North African countries have, on average, better infrastructure than sub-Saharan African economies, with the exception of South Africa (AfDB, 2013). This can be seen with regard to access to electricity, mobile subscriptions and paved roads. Blanket access to electricity has been achieved in rural and urban areas in Algeria, Egypt, Libya, Morocco and Tunisia. However, in Mauritania, 21.7% of the total population has access to electricity. The percentage is lower in rural areas, with coverage of only 4.3% of the total rural population (World Bank, 2012).

Moreover, paved road as a percentage of the total roads is higher for all the countries in the region (with the exception of Mauritania and Libya) than in the rest of the continent; 77.1%, 92.2%, 70.6% and 76.3% in Algeria, Egypt, Morocco and Tunisia respectively (AfDB, 2015).

Mobile cellular subscribers in all the countries of North Africa are higher than in sub-Saharan Africa, where the rate of subscriptions is 71 per 100 people. Subscriptions per 100 people number 92.9, 114.3, 94.2, 131.7, 128.5 and 161.1 in Algeria, Egypt, Mauritania, Morocco, Tunisia and Libya (World Bank, 2014).

Regarding energy there are two main PIDA projects in the region. The North Africa Transmission intends the construction of a 2,700-kilometer transmission line with a 4,500 megawatt capacity from Morocco to Egypt through Algeria, Tunisia and Libya, and currently is undergoing feasibility and needs assessments. The Nigeria-Algeria Pipeline aims to construct a 4,100 km gas pipeline from Warri, Nigeria, to Hassi R'Mel, Algeria, for exports to Europe. The pipeline is more advanced and is currently undergoing structuring and promotion to obtain further financing. The main transport project in the region is the Trans- Maghreb Highway, which intends to better connect and improve travel for people and goods across the Maghreb countries, overcoming artificial barriers between countries to enhance trade. The highway project is currently being implemented (PIDA, 2015).

II. SOCIAL INCLUSION

North African countries have achieved major progress in the social welfare of their populations, improving education, health and poverty indicators. Nevertheless, some aspects of human development remain weak, relative to countries' per capita income, such as social inclusion, voice, accountability and participatory mechanisms. This contributes to an overall sense of disempowerment amongst the population.

Health

All the countries in the region, except Libya, which fell 27 positions on the HDI ranking from 2009 to 2014, have constantly improved their ranking since 2000. Algeria, Libya and Tunisia rank 84th, 94th and 96th respectively, and fall into a high HDI category; Egypt and Morocco rank 108th and 126th, falling into the medium HDI category. Mauritania ranks 156th, which means it has a low HDI ranking (Economic Outlook, 2016).

From 1990 to 2013 maternal, infant and under-5 mortality rates more than halved in all the countries, except Mauritania (UNECA, 2013). Under-5 mortality rates remained significantly below the sub-Saharan Africa rate (83.2 per 1,000) in Algeria (25.5), Egypt (24), Libya (13.4), Morocco (27.6) and Tunisia (14), yet remained alarmingly high in Mauritania (84.7). Life expectancy at birth in the six countries is higher than in sub-Saharan Africa (where it is 58.6). Life expectancy is highest in Algeria, at 74.8 years, and lowest in Mauritania, where it is 63 years.

Malnourishment levels in the population are also low in comparison with sub-Saharan Africa, where the prevalence of undernourishment as a percentage of the population is 18.5%, while the average in North Africa is 5%. Adolescent fertility rates are also significantly lower in North Africa in comparison to sub-Saharan Africa, where 103 are born per 1,000 women aged 15 to 19. The highest rate in the North Africa region is 79.4 in Mauritania and the lowest is 6.8 in Tunisia (World Bank, 2015).

NORTH AFRICA

3

Furthermore, incidence of tuberculosis is considerably lower in North Africa (63.8 per 100,000) than in sub-Saharan Africa (281), being the highest in Mauritania (111) and Morocco (106) and the lowest in Tunisia (33). Prevalence of HIV is the lowest among the other regions of the continent, representing less than 1% of the population aged 15-49. As an indicator of the state of the health system, the number of physicians per 10,000 people in the region is 7 times higher than in sub-Saharan Africa, with an average of 13.2 physicians per person. The largest number of doctors is in Egypt, with 28.3 per person, and the lowest is in Mauritania, where it is 1.3, which is lower than the average in sub-Saharan Africa (1.9) (World Bank, 2015).

HEALTH INDICATORS

Country	Mortality under-5 (per 1,000) 2015	Life expectancy at birth, total (years) 2014	Prevalence of undernourishment (% of population) 2014	Adolescent fertility (births per 1,000 women ages 15-19) 2014	Incidence of tuberculosis (per 100,000 people) 2014	Prevalence of HIV, total (% of population ages 15-49) 2014
Algeria	25.5	74.8	5.0	10.8	78.0	0.1
Egypt, Arab Rep.	24.0	71.1	5.0	52.4	15.0	0.1
Libya	13.4	71.7	-	6.2	40.0	-
Mauritania	84.7	63.0	5.6	79.4	111.0	0.7
Morocco	27.6	74.0	5.0	32.1	106.0	0.1
Tunisia	14.0	74.1	5.0	6.8	33.0	0.1
Sub-Saharan Africa	83.2	58.6	18.5	103.0	281.0	4.5
North Africa (*)	**31.5**	**71.5**	**5.0**	**31.3**	**63.8**	**0.1**

Source: WB (*) based on authors' calculations.

NORTH AFRICA

Education

Regarding education, North Africa is performing considerably better that the rest of the continent. The literacy rate among adults in North Africa is 71.4%, while in sub-Saharan Africa it is 58.4%. The country with the highest rate is Libya, with 89.9%, while the lowest is Mauritania with 45.5%. Full primary school enrollment was achieved in the region.

Secondary and tertiary enrollments in the region, excluding Mauritania, are above the sub-Saharan Africa average and very similar to the world average. Gross secondary enrollment in the region averages 79.5% and is higher than the world average of 74%. The highest is in Libya, with 104%, and the lowest is in Mauritania, with 30%. Tertiary enrollment in the region is nearly four times higher than in sub-Saharan Africa, being 29.9%, a level that is very similar to the world average of 32% (UNDP-HDI, 2015).

Expected years of schooling in North Africa exceed the world average, with 12.7 years for females and 12.6 years for males, while in the world the average for females is 12.2 and for males is 12.4. The highest number of years is in Tunisia, where females are expected to study for 15 years and males for 14 years. The lowest number of years is in Mauritania, where females and males are expected to study for 8.5 years (UNDP-HDI, 2015).

Public expenditure on education in the region is above the world's average, but the quality of the education offered and constraints on access to top quality education remain an issue.

Gender and inequality

Although the situation of minorities has greatly improved in the areas of education and health, there are still significant drawbacks in terms of employment, access to means for production, remuneration, justice, and representation in decision-making. The availability and quality of service delivery, and equal opportunities for vulnerable groups such as women, children, youth and disabled and displaced people, need to be prioritized.

Regarding gender equality, all countries experienced substantial improvements in primary and secondary girl-to-boy ratio from 1990 to 2012 (UNECA, 2015), as well as in female parliamentary representation. Algeria, Tunisia and Mauritania have a greater share of women in parliament than the world average, for example.

However, gender inequality remains a major issue. The number of women with at least some secondary education is low when compared to the world average. In addition, males receive on average 1.7 more years of schooling and earn on average 3.6 times more than their female counterparts (UNDP HDI, 2015).

Regarding income inequality, North Africa is the most equal region on the continent with a Gini coefficient of 37 in 2013. The country with the greatest level of inequality is Morocco, with a coefficient of 40.9, followed by Mauritania, with 40.5. The least unequal country is Egypt, with a Gini coefficient of 30.8.

III. ENVIRONMENTAL SUSTAINABILITY

Climate change

The region is characterized by its dryness, as the majority of its territory is desert. The sub-region faces innumerable environmental issues such as water scarcity (water availability below 1000 m3/year), desertification (affecting 85% of the land), high vulnerability to climate change, land degradation, biodiversity loss, and natural resources depletion. Furthermore, arable land accounts for only 15% of the region's total surface area, and it is increasingly damaged by erosion, salinization, bad farming practices, and rural to urban migration. This results in greater food insecurity and increased dependency on imports (UNDP-HDI, 2015).

NORTH AFRICA

3

84.4 % of North Africa's population has access to an **IMPROVED WATER** source

Health extension worker demonstrates how to use a simple hand-washing device made of a water container and a biro at a house in Ethiopia.

Given its geographic and topographical conditions, the region is vulnerable to climate change. Coastal cities are at greater risk of natural disasters, particularly major cities such as Tunis, Casablanca, Cairo and Nouakchott. Additionally, carbon dioxide emissions per capita are growing at rates above the world's average. The rate of dependence on fossil fuel for energy supply is higher than 85% in all countries. Furthermore, industrial, urban and agricultural pollution are depleting natural resources, presenting alarming costs to the economies of the region. For instance, natural resource depletion as a percentage of the GNI in Mauritania is 32.6%, in Libya 23.5% and in Algeria 18%. These rates are particularly disquieting when compared to the sub-Saharan African rate of 10% and the global rate of 4%.

The loss of forest area in Algeria and Mauritania between 1990 and 2012 has been substantially above both the sub-Saharan African and the global level. Forest coverage shrank by 11.6% in Algeria and 44.1% in Mauritania in the 12-year period (UNDP-HDI, 2015).

Water and sanitation

In terms of water and sanitation, North Africa has considerably better indicators than the rest of the continent. For instance, the percentage of the population that has access to improved sanitation facilities is 81.2%, while in sub-Saharan Africa it is 29.7%. The country with the highest access to improved sanitation is Libya with 96.6%, while Mauritania has the lowest, with 40%, which in particular impacts rural populations.

Access to improved water sources is higher in the sub-region than in sub-Saharan Africa: 84.8% of the population has access to an improved water source, compared with 67.8% on average across sub-Saharan Africa. The best is Egypt, where 99.4% of the population has access to improved water sources and the poorest in terms of access to an improved water source is Mauritania, where the proportion is 57.9% (World Bank, 2015).

NORTH AFRICA'S REGIONAL PRIORITIES AND RECOMMENDATIONS

Sustainable development priorities	Priority actions
1. **Diversify economies and exports** To ensure growth has a solid base and augment resilience to global external shocks.	1.1 **Reduce dependency on fuel and mining exports and food imports.** Foster national agricultural production, with new efficient irrigation systems and better agricultural practices, such as enhanced inputs. 1.2 **Industrialization and value added creation**. Diversify production systems and create processing industries for primary products in order to expand the share of total trade of intermediate goods and services. 1.3 **Strength regional trade**. Lower barriers and tariffs, facilitate trading and manufacturing procedures, and enhance infrastructure in the territory. 1.4 **Improve business climate**. Facilitate private and foreign investment by reforming investment codes, operationalizing public-private partnership regulation, and renovating administrative procedures related to economic activities.
2. **Inclusive job creation** Structural unemployment is a phenomenon undermining the economic prosperity of the region, affecting particularly youth and women and enhancing negativity towards political institutions.	2.1 **Labor reform**. Formalization aims to relax contracting and termination policies. 2.2 **Support private sector to absorb and create new jobs.** 2.3 **Vocational and technical education**. Ensure the new labor supply has the right combination of soft skills and job-specific capabilities to satisfy the needs of the labor demand.
3. **Promote equality and social inclusion.** There remain signifcant drawbacks in terms of employment, access to means of production, remuneration, justice and representation in decision making.	3.1 **Broadening the economic opportunities for women and the youth**. Labor reforms facilitate and reward the hiring of women and young people. 3.2 **Secondary and tertiary education for women**. Aim to retain young women in secondary school and attract them to enroll in tertiary education.

NORTH AFRICA

3

Sustainable development priorities	Priority actions
4. **Decentralization.** Transferring fiscal autonomy and resources from the central government to lower levels of government can boost regional development, raise local revenues, increase local spending, improve accountability and empower local actors.	**4.1 Matching fiscal with political decentralization**. Localize the national goals by gradually increasing central transfers to local levels, with the efficient allocation of fiscal revenue, and greater local responsibility for public services and local infrastructure to increase accountability. **4.2 Matching grant mechanism**. Central government can increase local capacity by matching local fiscal revenue with a determined-ratio grant. **4.3 Local capacity building**. Central government should provide advice to local governmental bodies and community officials on how to spend, execute and efficiently allocate their resources. **4.4 Equal distribution of extractive royalties**. Revenues from extractive sectors including oil, gas and mining should be better mobilized through more effective taxation into specific agendas.
5. **Adapt to climate change**. An increase in temperature is expected to continue, decreasing summer precipitation, increasing water stress, augmenting drying trends in the region and impacting coastal areas.	**5.1 Tapping renewable energy potential.** Policy reforms and significant investments must be made to help the sub-region adapt to climate change and to increase investment in renewable energy technologies, in particular tapping the region's notable potential in both solar and wind technologies. **5.2 Public-private partnerships**. Public and private efforts should be made to mobilize resources, knowledge and clean technologies oriented to reduce biodiversity loss, land degradation and GHG emission. **5.3 Proper taxing on natural resource exploitation**. Taxes based on gross volume or value of output should not only serve as non-earmarked revenue for the government, but the increase in production and revenue from these profitable sectors should benefit the development and implementation of green economy initiatives.
6. **Good governance.** This pillar will have a positive cross-sectoral impact at the national and regional levels, augmenting state delivery capacity, facilitating access to basic services, creating inclusive opportunities and sustainable and decent jobs, and protecting natural resources, biodiversity and ecosystems at the sub-regional and local levels.	**6.1 Strengthen institutional capacity of state and non-state actors at national and local level in order to increase capacity and create effective mechanisms for policy implementation, accountability and responsiveness.** **6.2 Increasing civic voice and representation.** Provide citizens with better tools to hold their governments accountable, like consultative mechanisms, more society-based organizations, public disclosure of government actions, greater freedom of information and expression, and independent and responsible media. **6.3 Enhance national checks and balances.** Balanced and fair allocation of power, greater independence to the judiciary system, constraint to the executive should be more operational, improving the professional capacity of both legislative and judiciary branches.

CASE STUDY – NORTH AFRICA

The "Jasmine Revolution" – The power of the people

The Arab Spring began in Tunisia in 2010-2011 and quickly spread to a number of countries in North Africa and the Middle East. The so-called "Jasmine Revolution" in Tunisia was a historic event. It evidenced for the first time a real democratic transition based on a vibrant civil society presenting their demands. The people of Tunisia wanted a constitutional government that would provide fundamental rights for the entire population, regardless of gender, political conviction or religious belief. The "Jasmine Revolution" is considered particularly important given the fact that other Arab Spring countries fought for achieving democracy and fundamental rights, but their efforts came to a standstill or suffered setbacks.

The Tunisian civil society was the main driving force behind the establishment of a pluralistic democracy; it played a vital role in mobilizing opposition to the 55-year old regime.

Organizations and individuals came together, irrespective of their sectarian, ethnic, religious, tribal, political and ideological affiliations, to call for the free exercise of their rights as citizens and to find consensus-based solutions to a wide range of challenges across political and religious divides.

Key Achievements

- A constitution widely regarded as the most progressive in the region
- Open, free and peaceful parliamentary and presidential elections in 2014
- Government coalition between four parties, bounded by the constitution

Tunisia became an inspiration for people throughout the Arab world who wanted better models for representation and governance. It showed them that religious and secular political movements can work together to achieve positive results in the best interests of a nation. As the only Arab country that has successfully progressed from popular protest to democracy, Tunisia is now broadly considered key to the future stability of the Arab world.

JASMINE REVOLUTION TUNISIA

2010/11 a real democratic transition

progressive constitution

free elections 2014

Government Coalition between 4 parties

NORTH AFRICA

3

PIDA REGIONAL INFRASTRUCTURE PROJECTS – NORTH AFRICA

ENERGY SECTOR					
Project	Description	Cost ($ millions)	Stage	Countries	REC
North Africa Transmission	2,700 km line from Morocco to Egypt through Algeria, Tunisia and Libya	1,200	S2	Morocco, Algeria, Tunisia, Libya, Egypt	AMU
Nigeria–Algeria Pipeline	4,100 km gas pipeline from Warri to Hassi R'Mel in Algeria for export to Europe	NA	S2	Nigeria, Niger, Algeria	AMU/ ECOWAS

TRANSPORT SECTOR					
Project	Description	Cost ($ millions)	Stage	Countries	REC
Trans-Maghreb Highway	This program is designed to improve travel for people and goods across the Maghreb countries, which have had their trade and travel limited by artificial barriers between countries at the borders. The highway involves the design and implementation of a smart corridor system and installation of one-stop border posts.	75	S3/S4	Morocco to Egypt through Algeria, Tunisia and Libya	AMU

TRANS-BOUNDARY WATER RESOURCES					
Project	Description	Cost ($ millions)	Stage	Countries	REC
Nubian Sand-stone Aquifer System	Implementation of regional strategy for the use of the Nubian sand-stone aquifer system	5	S4	Nubian Sandstone Aquifer System	UMA
North-West Sahara Aquifer System	Prefeasibility studies for improved use of the North-West Saharan aquifer system	2.5	S2	North West Sahara Aquifer System	UMA
Lullemeden Aqui-fer System	Prefeasibility studies for improved use of the Lullemeden aquifer system	10	S2	Lullemeden and Taoudeni/ Tanezrouft Aquifer System	UMA

3 REGIONAL CHAPTERS

SOUTHERN AFRICA

SOUTHERN AFRICA

1. Angola
2. Botswana
3. Lesotho
4. Malawi
5. Mauritius
6. Mozambique
7. Namibia
8. Sao Tome & Principe
9. South Africa
10. Swaziland
11. Zambia
12. Zimbabwe

Background

The Southern African region displays considerable diversity comprising a mix of middle-income countries (MICs), low-income countries (LICs), landlocked and small island countries. The twelve countries that make up the Southern African region are home to 16% of the continent's' population and are responsible for over 40% of Africa's gross domestic product, valued at nearly $430 billion.

I. ECONOMIC SUSTAINABILITY

Economic growth

The region has experienced positive economic growth on average since 2000, the highest being over 6 % in 2006 and 2007 and slowing down in 2013 to 3.0%, and 2.3% in 2014. More than four fifths of the region's economy is contributed by two countries, South Africa and Angola, representing 71.5% and 10% of GDP respectively. Hence, the region's performance was greatly affected by the recent relatively poor growth in South Africa and Angola's deceleration, caused by the fall in oil prices.

On average, southern Africa grew 3.16% between 2010 and 2014, considerably less than the sub-Saharan African average of 4.42%. However, this low number is not representative of individual country performance. For instance, Zimbabwe grew on average by 8.44% in the same period, followed by Zambia (7.2%), Mozambique (7%) and Botswana (6.6%). The lowest growth rates were in Swaziland and South Africa, accounting for 2.2% and 2.4% respectively. Mozambique and Zambia were the countries with the highest average growth rates in the region, having grown on average between 2011 and 2014 at 6.5% and 7.3% respectively.

SOUTHERN AFRICA

3

Although the region has homogenous climatic and topographic conditions, economic indicators vary substantially across its nations. While the two wealthiest economies in the region have GDP per capita above the worlds average of $13,964 (Mauritius and Botswana with $16,648 and $15,247 respectively), its poorest economies' per capita GDP are significantly below the sub-Saharan African average of $3,339. Per capita GDP is $1,771 in Zimbabwe, $1,070 in Mozambique and $755 in Malawi.

ECONOMY GROWTH AND SIZE AND POPULATION – CURRENT AND 2030 PROJECTION

Country	Real GDP growth (%) (a)					GDP Contribution to region 2014 (%) (a)	Total population (b)	
	2010	2011	2012	2013	2014		2015 (million)	2030 Projection (million)
Angola	-	-	-	-	-	0.0	25.02	39.35
Botswana	8.6	6.0	4.8	9.3	4.4	3.8	2.26	2.82
Lesotho	7.9	4.0	5.0	4.5	3.6	0.5	2.14	2.49
Malawi	6.5	4.3	1.9	5.2	5.7	1.1	17.22	26.58
Mauritius	4.1	3.9	3.2	3.2	3.6	2.2	1.27	1.31
Mozambique	6.7	7.1	7.2	7.1	7.2	3.5	27.98	41.44
Namibia	6.0	5.1	5.1	5.7	6.4	2.7	2.46	3.27
Sao Tome and Principe	4.5	4.8	4.6	4.2	4.5	0.0	0.19	0.26
South Africa	3.0	3.2	2.2	2.2	1.5	79.7	54.49	60.03
Swaziland	1.7	1.3	3.0	2.9	2.5	0.8	1.29	1.51
Zambia	10.3	6.3	6.7	6.7	6.0	3.9	16.21	25.31
Zimbabwe	11.4	11.9	10.6	4.5	3.8	1.7	15.60	21.35
Sub-Saharan Africa	5.2	4.2	4.0	4.3	4.4	-	962.29	1396.85
Southern Africa*	**3.9**	**3.7**	**2.9**	**3.0**	**2.3**	**100.0**	**166.13**	**225.72**

Source: (a) WB (b) UN Population Division, Department of Economic and Social Affairs (*) based on authors' calculations, excluding Angola.

3 REGIONAL CHAPTERS

SOUTHERN AFRICA

The main economic sectors in Southern Africa are services, accounting for 51% of the sub-region's GDP, followed by industry (32%) and agriculture (17%).

Southern Africa's economic production base is dominated by raw materials, either from agriculture or mining. This high dependency has negatively affected the countries of the region because of global low commodity prices and high volatility. Furthermore, there is limited value addition in these sectors, which represent significant shares of the countries' economies. For example, mining and quarrying represented 88% of Zimbabwe's GDP in 2014, 40% of Angola's and 25% of Botswana's.

The region's mains challenges are chronic high unemployment, inequality, limited value addition in production, and restricted economic diversification. Total unemployment in the region averaged between 2008 and 2013 in 18%. Unemployment was highest in Namibia (29.6%), Swaziland (28.2%) and South Africa (25%). Furthermore, youth unemployment in the region was 30.3% in the same period, double the world's average of 15.1%. It was highest in Namibia, South Africa, and Mozambique, with rates of 56%, 51% and 39% respectively.

Poverty

Poverty levels in Southern Africa, despite improvements in the past decade, remained high. 39.1% of the region's population lives below the $1.25 poverty line, accounting for 46.7 million people. The nations with the highest incidences of poverty are Zambia (74.3%), followed by Malawi (72.2%), Mozambique (60.7%) and Lesotho (56.2%). The only country that has a poverty incidence rate of less than 10% is South Africa (9.4%).

If current levels of poverty remain, the population below the $1.25 poverty live will increase by 48% by 2030. This will have a greater impact in countries where population growth is higher, such as Zambia and Malawi, where the population below the poverty line will augment by 66.1% and by 54.2% respectively by 2030.

Infrastructure and energy

The region still has enormous gaps in infrastructure but, in general terms, it performs better than the rest of the sub-continent (excluding North Africa). Regarding paved roads, Mauritius has the largest percentage of paved road as a percentage of total roads, being 98%, followed by Sao Tome and Principe with 68.1% and Lesotho with 54%. The lowest percentage of paved road is in Angola (10.4%), followed by Namibia (14.5) and South Africa (17.3) (AfDB, 2015).

In terms of connectivity, the region is doing better than sub-Saharan Africa on average. For instance, the number of internet users in 2015 in the region was 21.3 per 100 people, whilst sub-Saharan Africa recorded 19.2. The largest number of internet user are in South Africa (49), followed by Mauritius (41.4) and Sao Tome and Principe (24.4), while the lowest are in Malawi (5.8), Mozambique (5.9) and Lesotho (11).

Mobile cellular subscriptions are higher than the sub-Saharan African average, with 91.6 subscriptions per 100 people in Southern Africa (versus 71 per 100 in sub-Saharan Africa). Mobile subscriptions are the highest in Botswana (167.2), South Africa (149.2) and Mauritius (132); and are the lowest in Malawi (33.4), Angola (63.4) and Sao Tome and Principe (64.9) (World Bank, 2012).
The percentage of the population in South Africa that has improved access to electricity is 44.8%, which is considerably higher than sub-Saharan Africa on average (35%). The highest rate of electrification is found in Mauritius, at 100%, followed by South Africa (85.4) and Sao Tome and Principe (60.4%). Electrification is low in Malawi (9.8%), Mozambique (20.2%) and Lesotho (20.5%). Access to electricity in rural areas in South Africa is twice as high as it is in sub-Saharan Africa on average, being 27% in rural areas of Southern Africa and 15.2% in sub-Saharan Africa. Nonetheless, the population in rural areas without access to electricity is strikingly high in Malawi, Mozambique, Zambia and Angola (where only 2%, 5.4%, 5.7% and 6% respectively have access to electricity).

SOUTHERN AFRICA

3

POVERTY LEVELS – CURRENT AND 2030 PROJECTION

Country	Population living on below $1.25 PPP per day		
	(%) 2002-2012 (a)	2002-2012 (million) (b)	2030 (million) (b)
Botswana	-	-	-
Lesotho	56.2	1.2	1.4
Malawi	72.2	12.1	18.7
Mauritius	-	-	-
Mozambique	60.7	16.1	23.6
Namibia	23.5	0.6	0.7
Sao Tome and Principe	43.5	0.1	0.1
South Africa	9.4	5.0	5.5
Swaziland	39.3	0.5	0.6
Zambia	74.3	11.2	18.5
Zimbabwe	-	-	-
Southern Africa*	39.1	46.7	69.1

Source: (a) UNDP HDI 2015 (b) Estimates based on UNDP-HDI 2014 Population (*) based on authors' calculations.

One of the major infrastructure projects is the North-South Power Transmission Corridor, 8,000 km of transmission lines from Egypt through Sudan, South Sudan, Ethiopia, Kenya, Malawi, Mozambique, Zambia and Zimbabwe to South Africa, to transport energy generated by the Great Millennium Renaissance Dam. The corridor will provide the infrastructure for an integrated East and Southern African power market, which will allow increased regional power trade. The project is at different stages in the various countries involved, ranging from project structuring and promotion to obtain financing to implementation.

Another main infrastructure project is Mphanda Nkuwa Hydropower, which aims to construct a gravity dam with 13 floodgates and a 1,500 megawatt hydropower plant with four 375-megawatt turbines in Mozambique on the Zambezi River Basin. The hydropower dam will ensure the export of electricity to South Africa and to the Southern African Power Pool (SAPP) (PIDA, 2015).

II. SOCIAL INCLUSION

In terms of social development, the region has experienced progress in primary education, bridging the gender gap and reducing child mortality. However, key challenges in health and education persist, particularly due to the high incidence of diseases, high rates of HIV and AIDS, poor health service delivery, and low levels of enrollment in secondary and tertiary education.

3 REGIONAL CHAPTERS

SOUTHERN AFRICA

There is a wide variance between countries of the region and social development. Mauritius is the only country with a high human development index (above 0.7), ranked 63th out of 188. Botswana, Namibia, Sao Tome and Principe, South Africa and Zambia have a medium HDI (between 0.55 and 0.7), while Angola, Swaziland, Zimbabwe, Lesotho, Malawi and Mozambique have a low HDI ranking (ranking 149th, 150th, 155th, 161th, 173th and 180th out of 188 countries).

Health

Southern Africa´s health status, notwithstanding current progress, is still remarkably poor. For instance, life expectancy in the region is only 59.4 years on average, being the highest in Mauritius (74.2 years) and the lowest in Swaziland (48.9 years). Under-five mortality rates, despite being lower than in sub-Saharan Africa, remain high, particularly in Angola, Lesotho, Mozambique and Zimbabwe (which registered 162.2, 92, 81.2 and 72.3 deaths per 1,000 live birth in 2013, respectively).

Child malnutrition is a challenge across the region; on average 33% of children under-five are stunted. Malawi, Zambia and Mozambique have the highest stunting rates, at 47.8%, 45.8% and 43.1% respectively.

Adult mortality rates, accounting for 288 females and 337 males per 1,000 people, are significantly higher in Southern Africa than in sub-Saharan Africa. Prevalence of malnourishment among the total population is 19.7%, which is higher than the sub-Saharan African average of 18.7%. The countries with the largest percentage of malnourished people are Zambia (48.4), Namibia (42.3) and Zimbabwe (34).

Deaths due to malaria are still an issue in Angola, Zambia and Mozambique, countries that registered 101, 79.2 and 72.4 deaths per 100,000 in 2012. Tuberculosis deaths are 1.6 times higher in the region than in sub-Saharan Africa, being alarmingly high in Lesotho, South Africa, Swaziland and Namibia, being 852, 834, 733, 561 cases per 100,000 respectively.

HIV/AIDS is an alarming topic in the region, as the prevalence among adults is 13.9%, which is triple the sub-Saharan average of 4.5%. It is particularly high in Swaziland, Lesotho, Botswana and South Africa, at 27.7%, 23.4%, 25.2% and 18.9% respectively.

Education

Southern African countries perform significantly better than the sub-Saharan African average, with the exception of Mozambique. Primary enrollment targets were achieved by every country in the region, but secondary and tertiary education remain significant challenges.

In Mozambique, Angola and Malawi, secondary enrollment rates were lower than the average in sub-Saharan Africa. Furthermore, excluding Mauritius, tertiary enrollment in the region was 9%, only one percentage point above the sub-Saharan African average. Primary dropout rates are high as well, if Mauritius is excluded: the average in the region is equal to the sub-Sahara African average, 37.9%, and dropout is particularly high in Mozambique, Angola, Zambia and Lesotho, (at 68.4%, 86.1%, 44.5% and 43.2% respectively) (UNDP-HDI 2015).

Expected years of schooling are 1.3 times higher in Southern Africa than the average in sub-Saharan Africa. Males in the region are expected to have on average 12.1 years of schooling, while women have only 11.6 years. Amount of time spent in education is particularly low for females in Angola (8.7 years) and Mozambique (8.8 years) and for males in Mozambique (9.8 years) and Malawi (10.7 years). Expected schooling years are the highest in Mauritius (15.9 years) and South Africa (13.7 years)for females and Angola (14 years) for males (UNDP-HDI 2015).

SOUTHERN AFRICA

3

HEALTH INDICATORS

Country	Mortality under-5 (per 1,000) 2015	Life expectancy at birth, total (years) 2014	Prevalence of under-nourishment (% of population) 2014	Adolescent fertility (births per 1,000 women ages 15-19) 2015	Incidence of tuberculosis (per 100,000 people) 2014	Prevalence of HIV, total (% of population ages 15-49) 2014
Angola	162.2	52.3	15.3	166.6	370.0	2.4
Botswana	44.8	64.4	24.8	33.6	385.0	25.2
Lesotho	92.0	49.7	11.2	92.3	852.0	23.4
Malawi	66.9	62.7	20.8	137.0	227.0	10.0
Mauritius	13.9	74.2	5.0	28.6	22.0	0.9
Mozambique	81.2	55.0	26.2	142.5	551.0	10.6
Namibia	46.4	64.7	42.3	77.4	561.0	16.0
Sao Tome and Principe	49.0	66.4	6.4	85.2	97.0	0.8
South Africa	41.4	57.2	5.0	46.6	834.0	18.9
Swaziland	62.6	48.9	26.5	73.6	733.0	27.7
Zambia	66.6	60.0	48.4	93.0	406.0	12.4
Zimbabwe	72.3	57.5	34.0	110.4	278.0	16.7
Sub-Saharan Africa	86.1	58.6	18.7	103.0	281.0	4.5
Southern Africa (*)	**66.6**	**59.4**	**19.7**	**90.6**	**443.0**	**13.9**

Source: WB (*) based on authors' calculations.

SOUTHERN AFRICA

Gender and inequality

Progress in attaining gender equality has been most visible with regard to women's political representation and in education. The share of seats held by women in Southern Africa is 25%, higher than the world average of 21.8%. The difference between average years spent in school by men and women is only 0.69, much smaller than the average discrepancy in sub-Saharan Africa of 1.8 years (and also smaller than the global discrepancy of 1.7 years).

However, male participation in the workforce is 14% higher in the region, and the estimated income per capita is 1.63 times higher for men than for women (UNDP-HDI 2015).

Income inequality one of the major issues in the region: South Africa, Namibia and Botswana are among the five most unequal countries in the world, registering Gini coefficients of 65, 61.3 and 60.5 respectively.

III. ENVIRONMENTAL SUSTAINABILITY

The Southern African states recognize the importance of the sustainable use and management of the environment in the fight against poverty and food insecurity. Although there has been some progress in environmental management, there are still high levels of pollution, loss of bio-diversity, inadequate access to clean water and sanitation services, and land degradation and deforestation. Without a doubt, Southern Africa's development has taken a toll on the environment and must be remedied urgently to reverse the environmental mismanagement.

Climate change

Livelihoods and economic activities in Southern Africa depend heavily on weather and climate. While the entire world is struggling with the challenges presented by the changing global climate, Southern Africa is uniquely susceptible to the impacts of climate change.

In the coming decades, Southern Africa is expected to experience higher land and ocean surface temperatures than in the past, which will affect rainfall, winds, and the timing and intensity of weather events. Climate change poses a number of risks to the goals for regional economic development. Increased frequency of floods, cyclones, and droughts may damage infrastructure, destroy agricultural crops, disrupt livelihoods, and cause loss of life.

It has been estimated that over 75% of the land in the Southern Africa region is partially degraded, with 14% classified as severely so. SADC member states should reduce emissions from deforestation and forest degradation using regional frameworks. Southern Africa has experienced the highest rate of deforestation in Africa since 1990, contributing 31% to Africa's deforested area, primarily due to the expansion of agriculture, shifting cultivation and unregulated logging due to poverty, strong population growth, rising energy demands, and poor institutional capacities. Moreover, selective harvests in some countries exceed sustainable yield.

Forest degradation contributes to substantial emissions. Biomass carbon losses from deforestation in SADC member states amount to 54% of those from the entire continent. Carbon emissions from combined deforestation and degradation are over five times larger than those from all other sources.

The coast in Southern Africa is a major source of livelihood. The management of the coastal zone and offshore waters is critical for the sub-region in the face of mounting human pressure, the impacts of which have become increasingly acute within the last 50 years or so. Marine life has suffered immensely from physical destruction, resulting from pollution of habitats, land-based activities such as oil and gas exploration, and the clearance of mangroves for local consumption, export, agriculture and fuel-wood, leading to siltation. If this continues unchecked, all commercial fish stocks in the ocean could be extinct by 2050 and 60% of our coral reefs will be gone by 2030, according to projections.

Meanwhile, emissions are soaring. South Africa produces some of the worst industrial air pollution in the world, and there is growing concern that crop production, forestry,

SOUTHERN AFRICA

3

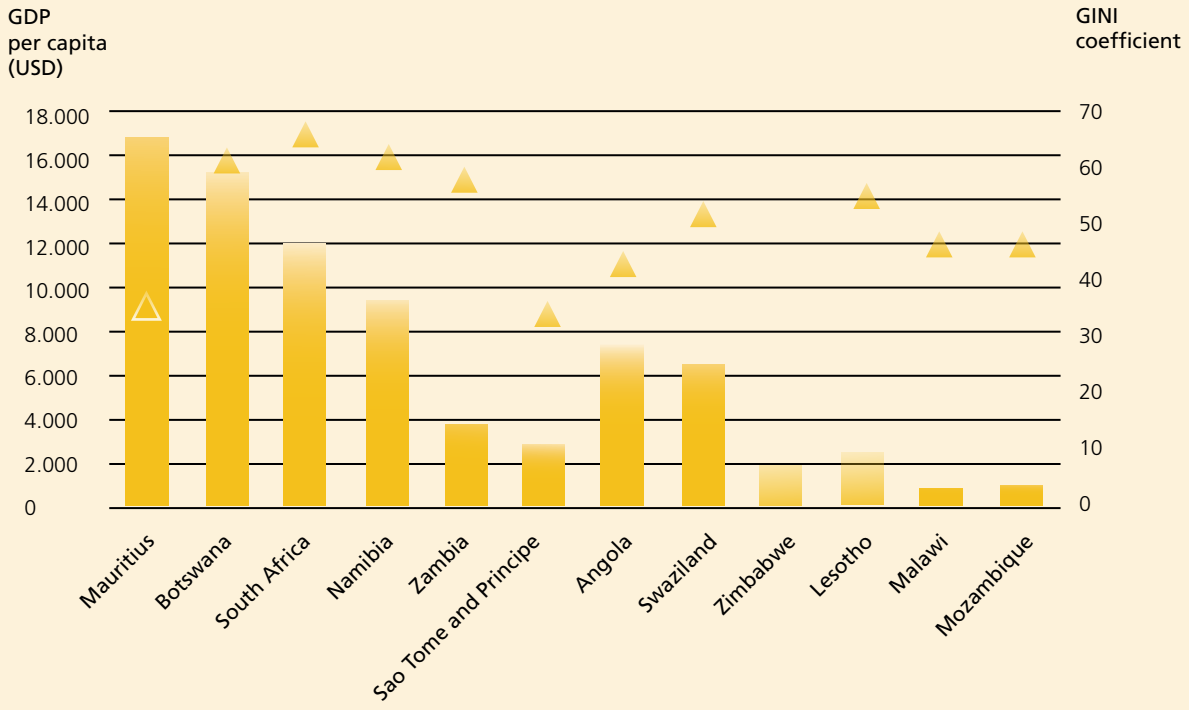
water resources and human health in neighboring Lesotho, Mozambique and Swaziland, will begin to suffer from the effects of acid rain.

Water and sanitation

While Southern African countries have made progress in improving access to drinking water and basic sanitation, certain countries are still lagging behind. There was significant disparity in the water and sanitation coverage in Southern African in 2015. Regarding access to improved drinking water, a joint UNICEF and WHO report revealed in 2015 that while Mauritius had attained 100% access to improved drinking water, Angola had only attained 49% coverage of the same. Improved drinking water coverage was on track in Sao Tome & Principe (97%), Botswana (96%), South Africa (93%), Namibia (91%), and Malawi (90%). While the coverage of clean drinking in Lesotho was 82%, the coverage for Zimbabwe, Swaziland, Zambia and Mozambique was significantly lower, ranging from 77% to 51%. The improved water coverage was much lower in rural areas as compared to urban areas.

Regarding basic sanitation coverage in the Southern Africa sub-region, the UNICEF and WHO data revealed huge disparities between the countries. With the exception of Mauritius, whose basic sanitation coverage was 93%, other Southern African countries had a low coverage ranging between 66% for South Africa to 21% for Mozambique. Basic sanitation coverage was as follows: 63% in Botswana, 57% in Swaziland, 52% in Angola, 44% in Zambia and 41% in Malawi. The coverage of adequate sanitation for Zimbabwe, Sao Tome and Principe, Namibia and Lesotho was exceptionally low, ranging between 37% and 30%.

PER CAPITA GDP AND GINI COEFFICIENT



Source: World Bank.

3 REGIONAL CHAPTERS

SOUTHERN AFRICA

SOUTHERN AFRICA'S SUSTAINABLE DEVELOPMENT PRIORITIES

Sustainable development priorities	Priority actions
1. Increase economic growth, reduce unemployment, reduce poverty, reduce income inequalities and increase value addition	1.1 **Reduce poverty rates through industrialization and diversification.** More than half of the population of most Southern African nations has been living below the poverty line for the past decade or longer. Southern Africa's economic production base is dominated by raw materials from agriculture and mining. There is limited value addition on minerals, and regional trade largely revolves around one country - South Africa. Agricultural production is largely focused on achieving food security for countries such as Malawi and Zambia, which depend on subsidized agricultural inputs. The top HDI ranked country in the region, Mauritius, is unique because of its diversified economic base comprising commercial agriculture, tourism and services. The countries that depend more on mineral exports outside Africa, however, were negatively affected by the global financial crisis. 1.2 **Reduce income inequality.** Market imperfections that favor a sub-optimal investment in human capital, which later lead to low growth performances, must be reversed. Human capital investment is too low, largely because of externalities. 1.3 **Increase value addition to minerals and agriculture.** Southern African countries should prioritize value addition to boost large-scale production of goods, which are available to the consumer at much cheaper rates. In turn, people's standard of living will be improved. 1.4 **Reduce high unemployment.** Through industrialization, Southern African countries will be able to create new job opportunities and bridge the unemployment gap.

SOUTHERN AFRICA

3

Sustainable development priorities	Priority actions
2. Social inclusion particularly HIV incidence prevention, increased enrollment post primary school and gender distribution of wealth.	2.1 **Inclusive health, especially reduced incidence of disease, HIV/AIDS and improved health service delivery.** Southern African countries should consider increasing their internal and external funding for health service delivery and HIV incidence prevention programs. 2.2 **High level of enrollment in education beyond primary school.** Southern Africa countries should continue to improve the primary school enrollment rates in addition to improving secondary and upper-secondary school enrollment rates. 2.3 **Equal distribution of wealth between gender.** Women experience greater economic vulnerability than men due to wealth disparities. As such, women will have less wealth to support themselves. Women's financial dependency makes them more vulnerable. Southern Africa countries must close the gender wealth gap.
3. Environmental management and sustainability	3.1 **Mainstreaming environmenal and sustainable development.** Southern African countries should integrate concerns for sustainable development into their policies, strategies and programs. This will complement and supplement national environmental and sectoral environmental impact assessment regulations and guidelines. The goal is to ensure that all development efforts in the region take environment into consideration to ensure the region's sustainable development. 3.2 **Preserve the natural heritage, biodiversity and life supporting ecosystems in Southern Africa.** After decades of unsustainable development largely driven by increasing population, industrialization and urbanization, the lives and livelihoods of many people and communities throughout the Southern Africa region are threatened by environmental degradation. Mitigating deforestation, soil degradation, declining biological diversity and over exploitation of wildlife, fisheries and rangelands, will enhance the development prospects for present and future generations.

CASE STUDY – SOUTHERN AFRICA

Demystifying the resource curse – Botswana's good economic policies

In the developing world, abundant minerals do not necessarily translate into solid economic growth. Often, national governments claim ownership of the resources and, if institutions are weak, the potential benefits of resources do not trickle down to the population.

Botswana's economy has been one of the most successful in the world in dealing with natural resource discoveries.

When Botswana became independent in 1966, the landlocked country was one of the poorest in the world, with a per capita income of $70 a year. Approximately 60% of government's expenditure came from aid. Half a century later, Botswana is an upper-middle income economy with a per capita GDP of $15,247 (PPP), 4.6 times larger than the average across sub-Saharan African. It has significantly reduced its poverty and made massive investments in public services such as education and health.

Botswana's extraordinary growth was fueled by diamonds, but the growth was sustained and its benefits were far-reaching due to economic policies that prevented what is known as 'Dutch disease' (the negative impact on an economy of anything that gives rise to a sharp inflow of foreign currency) and promoted good governance.

UNDP Administrator Helen Clark meeting with villagers and chiefs in Malawi. Photo © Christina LoNigro/UNDP

Key policies

1. Public expenditure was not attached to mineral revenue
2. Current account surplus was set aside and saved
3. Reserve accumulation as a protection against declines in mineral revenues
4. No import substitution
5. Limited role of parastatals
6. Investment in infrastructure and human capital to increase national productivity and competitiveness

Mineral revenues have started to decline, but Botswana's government has adopted numerous measures to prepare for the depletion of its mineral base, by accumulating funds for the future, building infrastructure, and investing in health and education.

WEST AFRICA

3

WEST AFRICA

1. Benin
2. Burkina Faso
3. Cape Verde
4. Côte d'Ivoire
5. Gambia
6. Ghana
7. Guinea
8. Guinea-Bissau
9. Liberia
10. Mali
11. Niger
12. Nigeria
13. Senegal
14. Sierra Leone
15. Togo

Western Africa comprises 15 countries: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo. The region is home to 30% of the continent's population, including the continent's most populated country and its largest economy: Nigeria.

The population in the region is expected to rise 46.2% by 2030, reaching 510.6 million people. The two most significant economic blocks are the Economic Community of West African States (ECOWAS), of which all 15 countries of the region are members, and the West African Economic and Monetary Union (WAEMU), of which the francophone states are members.

I. ECONOMIC SUSTAINABILITY

Economic growth

West Africa is the second fastest-growing region in Africa, despite several conflicts, civil turmoil and the outbreak of Ebola (UNDP, 2015b), which severely affected Guinea, Liberia and Sierra Leone. The region's GDP grew at 6.4% between 2006 and 2010 (African Economic Outlook, 2015) and 6.1% in 2014. This growth was driven primarily by Nigeria, which accounts for nearly 70% of the region's GDP (Ghana and Cote d'Ivoire account for 6.9% and 8.1% respectively, and the remainder is shared between the other 11 countries).

3 REGIONAL CHAPTERS

WEST AFRICA

Between 2010 and 2014 the economy that grew most rapidly was that of Sierra Leone, with an average growth rate of 10%, followed by Ghana (8.5%), Niger (6.8%), Burkina Faso (5.8%) and Nigeria (5.7). The economies that grew the least over the same period were Cape Verde with 2.1% and Guinea with 2.5%. Compared with sub-Saharan Africa, which grew by 4.4% on average between 2010 and 2014, West Africa grew 5.7% (World Bank, 2014).

This growth was driven mainly by the service sector (which represents almost 60% of the region's GDP), followed by the manufacturing and agriculture sector. Extractive industries were less important, which is a sign that the region – in particular Nigeria – is successfully diversifying (African Economic Outlook 2014). Despite this, crude oil represented 96% and 55% of Nigeria and Ghana's exports in 2013 (AfDB, 2013). In general, the region's exports are largely limited to fuel and food products (AfDB, 2015).

In general, growth in West Africa over the past two decades can be attributed to the following factors: successful resolution of political instability; strong global demand for West Africa's main export commodities especially crude oil and cash crops such as cocoa; new mining exploitation; better macroeconomic management, and the rapid recovery of post-conflict countries.

Nurse implanting contraceptive in Ghana.

Volunteers distributing bednets in Ghana.

Volunteer explains how to hang a bednet in Ghana.

WEST AFRICA

3

ECONOMY GROWTH AND SIZE AND POPULATION – CURRENT AND 2030 PROJECTION

Country	Real GDP growth (%) (a)					GDP Contribution to Region 2014 (%) (a)	Total Population (b)	
	2010	2011	2012	2013	2014		2015 (million)	2030 Projection (million)
Benin	2.1	3.0	4.6	6.9	6.5	2.4	10.88	15.59
Burkina Faso	8.4	6.5	6.5	3.6	4.0	3.0	18.11	27.24
Cape Verde	1.5	4.0	1.1	1.0	2.8	0.5	0.52	0.61
Cote d'Ivoire	2.0	-4.4	10.7	9.2	8.5	8.1	22.70	32.14
Gambia	6.5	-4.3	5.9	4.8	0.9	0.3	1.99	3.10
Ghana	7.9	14.0	9.3	7.3	4.0	6.9	27.41	36.87
Guinea	1.9	3.9	3.9	2.3	0.4	1.2	12.61	18.28
Guinea-Bissau	4.4	9.0	-2.2	0.3	2.5	0.3	1.84	2.54
Liberia	6.1	8.2	8.0	8.7	0.7	0.3	4.50	6.41
Mali	5.8	2.7	0.0	1.7	7.2	2.7	17.60	27.37
Niger	8.4	2.3	11.8	4.6	6.9	1.9	19.90	35.97
Nigeria	7.8	4.9	4.3	5.4	6.3	66.1	182.20	262.60
Senegal	4.2	1.8	4.4	3.6	4.7	4.1	15.13	22.80
Sierra Leone	5.3	4.5	15.3	20.9	4.6	1.1	6.45	8.60
Togo	4.0	4.9	5.9	5.1	5.7	1.0	7.30	10.49
Sub-Saharan Africa	5.2	4.2	4.0	4.3	4.4	-	962.29	1396.85
West Africa*	**6.9**	**4.6**	**5.3**	**5.7**	**6.1**	**100.0**	**349.15**	**510.62**

Source: (a) WB (b) UN Population Division, Department of Economic and Social Affairs (*) based on authors' calculations.

3 REGIONAL CHAPTERS

WEST AFRICA

West Africa has contributed significantly to the industrial growth of the continent in recent years. The industrial sector grew at a rate of more than 8% over the past two decades (African Economic Outlook, 2015). The rate of expansion varies significantly among countries in terms of magnitude.

The region maintained the lowest unemployment rates of the continent: countries like Benin, Côte d'Ivoire, Liberia, and Niger have experienced falling levels of unemployment. However, the reverse appears to be the case in Burkina Faso, where unemployment is rising. The average rate of unemployment in the region in 2013 was 7.2%, considerably lower than the average in sub-Saharan Africa, 11.9% (UNDP-HDI, 2015).

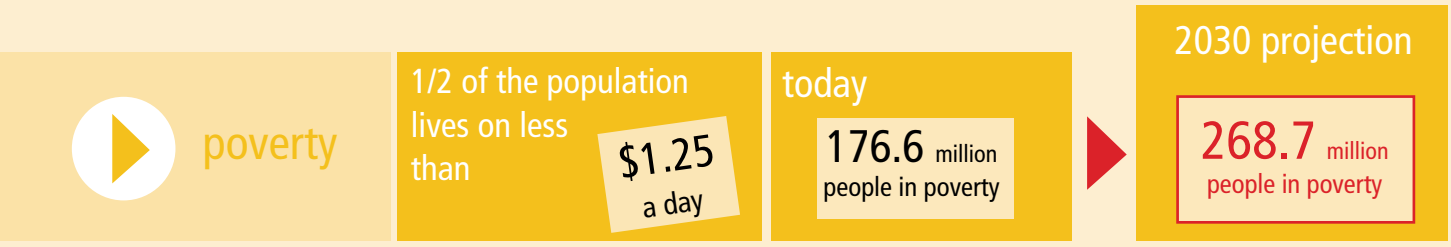
Although foreign direct investment (FDI) in the sub-region increased, representing the largest portion of GDP in Liberia, Cape Verde and Gambia, it failed to generate the employment needed to significantly boost incomes and reduce poverty, primarily because it focused more on the exploitation of mineral resources.

The balance of trade has deteriorated in all the countries over the past decades, except for in oil-producing countries. The deficit on the balance of goods and services as a percentage of GDP increased from 12.7% between 1995 and 2009, to 20.5% in 2011 on average in the region (EY, 2014). Countries in the region still rely significantly on debt funding from external sources, creating incentives to promote exports, run budgets efficiently and increase fiscal revenues.

Poverty

Poverty remains a major issue in the region: more than half of the population live below the $1.25 a day, representing 176.6 million people. Poverty rates are the highest in Liberia (83.8%) and Nigeria (62%), representing 110.7 million people, and Sierra Leone (56.6%) and Togo (52.5%). Ghana, Gambia and Senegal have the lowest poverty rates of 28.6%, 33.6% and 34.1% respectively (UNDP-HDI, 2015).

If current levels of poverty remain, by 2030, the population living on less than $1.25 per day in West Africa will have increased by 52.2%, encompassing 268.7 million people. This will have the greatest impact in countries with the highest population growth. For instance, in Niger, Mali and Nigeria, the population living below the $1.25 line will increase by 86.2%, 65.1% and 53% respectively, extending to approximately 170 million people in the next 15 years (UNDP-HDI, 2015).



WEST AFRICA

3

POVERTY LEVELS – CURRENT AND 2030 PROJECTION

Country	Population living on below $1.25 PPP a day		
	(%) 2002-2012 (a)	2002-2012 (million) (b)	2030 (million) (b)
Burkina Faso	44.5	7.7	11.8
Cape Verde	-	-	-
Cote d'Ivoire	35.0	7.3	10.2
Gambia	33.6	0.6	1.0
Ghana	28.6	7.6	10.1
Guinea	40.9	4.9	7.1
Guinea-Bissau	48.9	0.9	1.2
Liberia	83.8	3.7	5.4
Mali	50.6	8.0	13.2
Niger	40.8	7.6	14.1
Nigeria	62.0	110.7	169.4
Senegal	34.1	5.0	7.4
Sierra Leone	56.6	3.5	4.6
Togo	52.5	3.7	5.3
West Africa*	52.5	176.6	268.7

Source: (a) UNDP HDI 2015 (b) Estimates based on UNDP HDI 2014 Population (*) based on authors' calculations

3 REGIONAL CHAPTERS

WEST AFRICA

Energy and infrastructure

West Africa is lagging behind in term of infrastructure. Poor roads and constant power shortages not only hinder foreign investment but also hamper local economic performance. The percentage of paved roads as a share of the total roads remains low, at 20.5% on average. The highest proportion of paved roads is in Cape Verde (69%) followed by Senegal (35%) and Guinea-Bissau (27.9%). The countries with the smallest share of paved road are Liberia (6.2%), Core d`Ivoire (7.9%), Sierra Leone (8%) and Guinea (9.8%) (African Statistical Yearbook, 2015)

Furthermore, in terms of ICT and communications infrastructure, the nations fare poorly. Internet connectivity, measured as users per 100 people, is just 12.7. (The average in sub-Saharan Africa is 19.2.) Connectivity is the highest in Nigeria (42.6) and Cape Verde (40.26) and it remains remarkably low in Niger (1.9), Sierra Leone (2.1), Guinea Bissau (3.3) and Liberia (5.4).

Conversely, mobile cellular subscription levels are higher in West Africa than in sub-Saharan Africa, accounting for 90.2 subscriptions per 100 people in the region (compared with 71 on average in sub-Saharan Africa). The countries with the highest mobile subscription rates are Mali (149), Cape Verde (121.7), Gambia (119.6) and Ghana (114.8) (World Bank, 2014).

On average, the region has better electricity access than the sub-Saharan Africa average. The average percentage of people with access to electricity in West Africa is 38%, whereas the average across sub-Saharan Africa it is 35%. The highest electrification rates are in Cape Verde (70.5%), Ghana (64%) and Guinea Bissau (60.6%). The lowest rates are in Liberia (9.8%), Sierra Leone (14.2%) and Niger (14.4%). There is a significant gap between urban and rural populations, however: on average, 71.6% of the urban population has access to electricity in the region, compared to 15.2% in the rural areas (World Bank, 2012).

Three major energy related infrastructure projects are underway in the region: Sambagalou, a 128 MW hydropower at the mouth of the Gambia River will supply Senegal, Guinea, Guinea Bissau and Gambia. It is currently undergoing structuring and promotion to obtain financing. Secondly, the West Africa Transmission corridor is a planned 2,000 km line along the coast that will link up to the existing Ghana–Nigeria line with a capacity of 1,000 MW. It is currently being implemented and is operational in selected countries. Additionally, the Abidjan-Lagos coastal and Dakar-Niamey multimodal corridors – both aimed at modernizing the heavily travelled routes in the region – are in differing stages of planning and implementation (PIDA, 2015).

II. SOCIAL INCLUSION

West Africa leads the continent in progress towards reducing the number of people suffering from hunger and malnutrition. Malnutrition was cut by 60% over the past two decades. However, the prevalence of multidimensional poverty in West Africa is among the highest in the world. The region still lags behind in terms of human development – particularly in education, health, access to drinking water and the provision of other basic infrastructure – in spite of improvements (FAO, 2015).

Health

Health indicators have improved, but not enough. All countries in the region experienced an improvement in life expectancy over the period from 1995 to 2011. HIV infections per year per 100 people aged 15-49 more than halved in West Africa in the six-year period. However, much still needs to be done. Average life expectancy in the region is 59.2, which is low by global standards. Life expectancy is particularly poor in Cote d`Ivoire (51.6) and Nigeria (52.8). Prevalence of HIV, despite substantial progress, is still a major issue in Guinea-Bissau, Cote d'Ivoire and Nigeria where 3.7%, 3.5% and 3.2% of the population aged 15 to 49 are still infected by the virus (World Bank, 2015).

WEST AFRICA

3

HEALTH INDICATORS

Country	Mortality rate, under-5 (per 1,000) 2015	Life expectancy at birth, total (years) 2014	Prevalence of undernourishment (% of population) 2014	Adolescent fertility rate (births per 1,000 women ages 15-19) 2015	Incidence of tuberculosis (per 100,000 people) 2014	Prevalence of HIV, total (% of population ages 15-49) 2014
Benin	102.1	59.5	8.1	84.6	61.0	1.1
Burkina Faso	92.4	58.6	20.7	109.9	54.0	0.9
Cape Verde	25.2	73.1	10.0	73.7	138.0	1.1
Cote d'Ivoire	95.5	51.6	13.4	135.5	165.0	3.5
Gambia	71.1	60.2	5.4	113.6	174.0	1.8
Ghana	64.0	61.3	5.0	67.5	165.0	1.5
Guinea	97.0	58.7	16.8	141.7	177.0	1.6
Guinea-Bissau	96.2	55.2	22.0	91.4	369.0	3.7
Liberia	72.9	60.8	32.5	110.6	308.0	1.2
Mali	118.3	58.0	5.0	175.4	58.0	1.4
Niger	99.6	61.5	9.7	203.6	98.0	0.5
Nigeria	112.5	52.8	6.7	111.9	322.0	3.2
Senegal	49.7	66.4	10.6	80.3	138.0	0.5
Sierra Leone	126.4	50.9	22.7	119.6	310.0	1.4
Togo	80.8	59.7	12.9	92.0	58.0	2.4
Sub-Saharan Africa	86.1	58.6	18.7	103.0	281.0	4.5
West Africa	86.9	59.2	9.2	114.1	173.0	2.4

Source: (a) WB (*) based on authors' calculations.

WEST AFRICA

Under-five mortality rates are substantially higher than the sub-Saharan average (86.9 death per 1,000 live births): 126.4 in Sierra Leone, 118.3 in Mali and 112.5 in Nigeria, 100 in Cote d'Ivoire, 124 in Guinea Bissau, 123 in Mali and 160 in Sierra Leone (World Bank, 2015). Maternal mortality rates continue to be alarmingly high, accounting for 519 deaths per 100,000 live births in 2013 on average in the region, 2.47 times more than the global average.

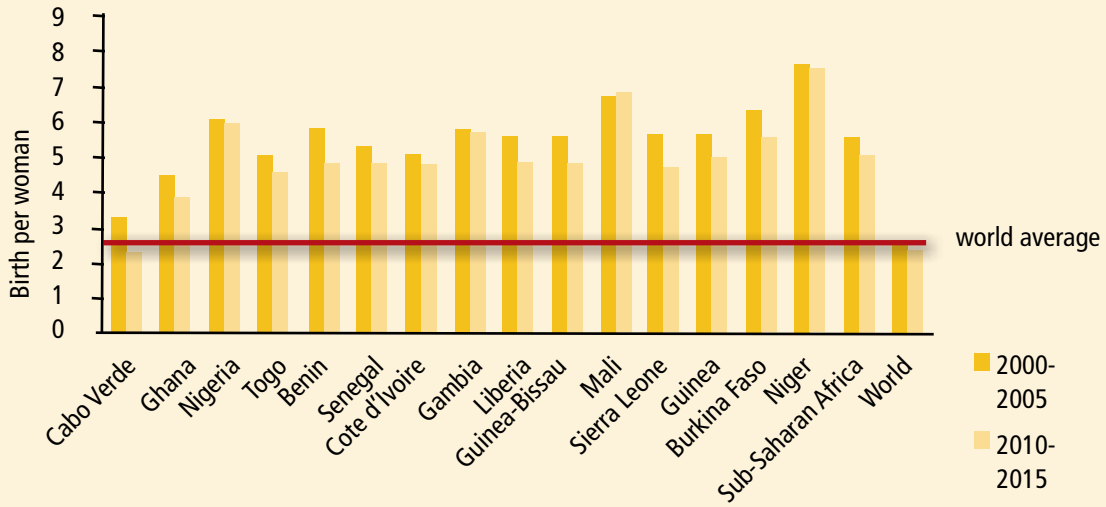
Nutrition statistics are also worrying. Stunting is significantly more prevalent in the region than in sub-Saharan Africa (where it affects 37.2% on average): 36.4% in Nigeria, 44.7% in Benin, 42% in Liberia, 39% in Mali, 45% in Sierra Leone and 43% in Niger (UNDP-HDI, 2015). The prevalence of malnourishment across the region's population is significantly lower than the average in sub-Saharan Africa, but it remains remarkably high in Liberia, Sierra Leone and Guinea-Bissau, where 32.5%, 22.7% and 22% of the population was malnourished respectively by 2014 (World Bank 2014).

Additionally, malaria still is a large cause of easily preventable deaths, with malaria mortality being significantly higher in West Africa than in sub-Saharan Africa (73 deaths per 100,000 people). Malaria accounts for 107 deaths per 100,000 in Nigeria, 109 in Sierra Leone, 105 in Guinea and 131 in Niger. The incidence of malaria and tuberculosis are a pressing issue: on average, deaths due to malaria and tuberculosis per 100,000 people in the region accounted for 83.7 and 28.8 respectively, which is higher than the average for sub-Saharan Africa (UNDP-HDI, 2015).

The incidence of tuberculosis, despite being substantially lower than in sub-Saharan Africa, remains a major issue in Guinea-Bissau, Nigeria, Sierra Leone and Liberia (with 369, 322, 310 and 308 cases per 100,000 people respectively) (World Bank 2014).

Furthermore, the health systems in most of the countries are poorly staffed; the average number of physicians in

TOTAL FERTILITY RATES



Source: World Bank.

WEST AFRICA

3

the region per 10,000 people is 1.1, almost half the sub-Saharan African average of 1.9. Public health expenditure is higher in West Africa than in sub-Saharan Africa, but it is still significantly below the global average (UNDP-HDI, 2015).

While population growth in the sub-region declined from 2.7% in the period 1990-1995 to 2.6% in the period 2000-2010, the region's average population growth has remained higher than the continent's average growth. Population growth in West Africa was 2.3 times higher than the world average population growth rate between 2010 and 2015. Fertility rates have also declined but remain high in certain countries such as Niger, Mali and Nigeria, where the number of birth per women are 7.6, 6.9 and 6 respectively.

The average adolescent fertility rate in the region is 114 births per 1,000 women aged 15 to 49, which is higher than the average in sub-Saharan Africa of 103. Adolescent fertility is alarmingly high in Niger (203), Mali (175.4), Guinea (141.7) and Cote d'Ivoire (135.5). Population growth is a major concern for the region. Mortality rates are declining and fertility rates remain high, but the fragility of the health and education systems, as well as the insecure food supply, mean that the countries are not prepared to cope with the sustained population increase.

The world's sharpest increase in birthrate between now and 2050 is expected to occur in Nigeria. By 2050, its population is projected to be approximately 389 million (World Bank, 2015).

Education

Despite education indicators having improved, the region remains behind in coverage and quality of education in comparison to the rest of the continent. Literacy rates have improved over the past decade but are still below the average for sub-Saharan Africa. In West Africa, 45.9% are literate, compared to 58.4% on average across sub-Saharan Africa. Literacy rates are highest in Cape Verde (85.6) and Ghana (72.5) and lowest in Niger (15.5) and Guinea (21.8).

The number of years spent in school in West Africa is slightly lower than in sub-Saharan Africa. On average, females in the region were expected to have 8.6 years of schooling, whereas across sub-Saharan Africa, females get 9.1 years on average. The number of years females spend in school is particularly low in Niger (4.8) and Sierra Leone (7.2).

Men in West Africa are expected to spend more time in school than women, bringing them into line with the sub-Saharan average. Expected years of schooling are on the same level as sub-Saharan Africa but are particularly low in Niger (6.1), Burkina Faso (8.1) and Senegal (8.1). (UNDP-HDI, 2015).

Full primary enrollment was achieved in the region in 2014. However, there is a large gap between primary and secondary enrollment caused by major dropout rates. The average gross secondary enrollment for the region is 46.3%, varying from 93% in Cape Verde to 16% in Niger. Furthermore tertiary education remains a major challenge: the average rate of enrollment in tertiary education in the region was 9.4% in 2014, with just 2% and 3% in Niger and Guinean Bissau, and 23% in Cape Verde (UNDP-HDI, 2015).

Aside from Ghana, Benin and Senegal, all the other countries of the region spend less than 5% of their GDP on education. The average public expenditure on education as a percentage of GDP in the region is 4.4%, which is below the sub-Saharan African rate of 5.1% (UNDP-HDI, 2015).

Gender and inequality

Despite primary and secondary girl enrollment having improved substantially, there are still major impediments for women in the region, basically access to equal education and economic opportunities. For instance, the

WEST AFRICA

share of seats in the parliament held by women is, on average in West Africa, just 14.6 %, significantly below sub-Saharan Africa's average of 22.5%. Men in the region had on average 1.83 times more years in school than females in 2014. When incorporated in the labor market, men earned 1.6 times more than their female counterparts (UNDP-HDI, 2015).

Regarding income inequality, West Africa is the third most unequal region on the continent with a Gini coefficient of 39.8 in 2013. The country with the greatest level of inequality is Gambia, with a coefficient of 47.3, followed by Togo with 46. The least unequal country is Niger, with a coefficient of 31.2.

III. ENVIRONMENTAL SUSTAINABILITY

Climate change

Climate change and the occurrence of natural disasters remain key challenges to sustainable development in the sub-region as droughts and floods present ever-greater threats to food security and people's livelihoods. Even though the sub-region's carbon dioxide emissions are the lowest on the continent, natural depletion as a percentage of GNI is higher in West Africa than in sub-Saharan Africa, ranging from 36.4% in Liberia to 1.5% in Senegal.

The rate of forest destruction is alarming: West Africa's forests reduced by more than a fifth between 1990 and 2012. This rate almost doubled the forest area lost in sub-Saharan Africa and almost six folded the world's average. For instance Nigeria has lost 52.3%, Togo 61% and Niger 39.4% of their total forest areas between 1990 and 2012 as a consequence of intensive agriculture, soil degradation, land tenure conflicts, desertification and unsustainable exploitation of natural recourses. (UNDP HDI 2015).

Environmental degradation has had a major effect on water availability. Various water bodies in West Africa are polluted, due to poor waste management, agricultural and industrial discharges and mining activities, especially small-scale mining. In addition, overfishing is leading to the depletion of aquatic resources. Deforestation, meanwhile, is contributing to the drying up of rivers, lagoons and lakes.

Water and sanitation

The population in West Africa lives, in general, in less sanitary conditions than the rest of the continent. On average, 29.8% of the population has access to improved sanitation facilities in sub-Saharan Africa, while in West Africa the percentage is 26.8%. Access to sanitation facilities is highest in Cape Verde (72.2%), Gambia (58.9%) and Nigeria (29%).

However, access to improved water sources is higher in West Africa than in sub-Saharan Africa: 76.8% of the population in West Africa have access to an improved water source, while in sub-Saharan Africa, only 67.5% benefit from an improved water source. Clean water access is highest in Cape Verde (91.7%), followed by Gambia (90.2%) and Ghana (88.7%), and lowest in Niger (58.2%) and Sierra Leone (62.6%). There is a significant gap between rural and urban population: only 66.1% of the rural population has access to improved water sources, whilst in urban areas the figure is 92.2% (World Bank, 2015).

WEST AFRICA

3

WEST AFRICA'S SUSTAINABLE DEVELOPMENT PRIORITIES

Sustainable development priorities	Priority actions
1. **Improve access to secondary and tertiary education and improve quality.** To achieve solid based economic growth, countries in the region need to improve the quality of primary education and increase access to secondary and higher education. Additionally technical education should be strategized, so that is relevant to current market needs.	1.1 **Primary completion** Galvanize efforts to improve the quality of primary education by: standardizing national curriculums; improving and distributing more instructional materials; improving teaching facilities; providing comprehensive teacher training, and giving better monetary incentives for teachers. 1.2 **Increase secondary education access.** Public expenditure on education must rise and a larger share should be allocated to secondary education. Strategies for pupil retention, school completion and cost effective programs need to expand access to schools and lower the unit cost for those enrolled. Increase access to tertiary and technical education and enhance regional collaboration. Strengthening tertiary and technical education in the areas of expertise demanded by local labor markets, such as agriculture, engineering, health, mining, science and technology.
2. **Improving healthcare delivery and controlling population growth.** Health systems in the region are fragile, precarious and lack adequate capital as well as both-medical and administrative human resources. Additionally, high fertility rates need to be urgently addressed; they don't just present greater burdens for health systems but also a serious impediment for poverty alleviation and sustainable development .	2.1 **Primary care delivery.** Effectively delivering essential high impact health service (HIHS) for the common diseases and health conditions that severely affect the region, particularly, child mortality, maternal mortality, and communicable diseases. 2.2 **Population control.** Deploy simple and effective interventions such as provision of family planning and post-partum family planning (PPFP) and generate awareness of contraceptive methods through grass-roots education initiatives.

WEST AFRICA

WEST AFRICA'S SUSTAINABLE DEVELOPMENT PRIORITIES ... continued

Sustainable development priorities	Priority actions
3. Structural transformation To ensure inclusive economic growth with solid foundations, the region needs to diversify exports, add value to their production processes, channel foreign direct investments and natural resource exploitation effectively, and support private sector development.	**3.1 Diversify and create added value for exports** Foster a broader base of exports following the transition from traditional (raw materials and agricultural commodities) to non-traditional exports, expand export revenues, add greater value along the production chain, and enhance growth through different channels. **3.2 Maximize the benefits of FDI and the extractive industries** Transform FDI into local human capital, enhance a competitive business environment, and develop home-grown enterprises. Revenues from extractive industries should be directed to achieve tangible development outcomes, particularly bridging the funding gap in health and education in the region. **3.3 Private sector development** Provide clear regulation on investment, trustful and enforceable contracts, improve transport and communications infrastructure, reduce the risk of capital losses, deliver better finance resources, and provide advice and technical assistance to respond to the specific needs, opportunities and challenges of the private sector. **3.4 Strengthening the financial sector** Adopt and implement financial standards and develop local capital markets. **3.5. Lowering regulatory barriers to investment** De jure and de facto investment regulation should be updated, so it is standardized and predictable.
4. Regional integration and spatial inclusion Integration is essential to attain sustainable and inclusive growth, as it shortens geographical distances and maximizes comparative advan tages by tapping potential markets and reducing transportation costs.	**4.1 Multi-sectoral cross-border initiatives** Implement integrated territorial development policies, combine sector strategies with spatial strategies, expand national and transnational infrastructure networks, and improve fiscal legitimacy, with the objective of increasing the autonomy of each region's territorial development strategy.

WEST AFRICA

3

Sustainable development priorities	Priority actions
5. **Infrastructure development** Scale up infrastructure investment in transport, energy and water. Funding should be leveraged from public and private partnerships, as well as from regional and interna tional bodies providing conces sional and non-concessional financial recourses.	**5.1 Transparent and efficient project preparation and execution** Separate political commitments and technical decisions, which should each be based on appropriate evaluation methods, to assess costs and benefits. Governments should implement robust infra-structure master plans, promote local capacity building, harness the private sector, avoid overspending and assess investment risks. **5.2 Leverage and coordinate various sources of funding** Engage and coordinate different investors: private sector, interna-tional governments, multilateral partners, and regional and inter-national development agencies to align resources with the West African infrastructure agenda. Additionally, governments should explore innovative financing solutions. **5.3 Capacity building** Prioritize matching local talent with international expertise right from the start of a project to ensure appropriate skills transfer. Continued investment in building local and regional competence while delivering successful projects, by developing training centers for both private and public sector stakeholders, is one of the easiest initiatives to implement and it should be adopted by more knowl-edge-based organizations.
6. **Good governance** Governments should put into practice mechanisms to be more representative, accountable and efficient delivering basic goods and public services to their citizens. Furthermore, they should be competent managers of their public finances and build a strong and reliable state presence across their countries to warranty security.	**6.1 Improve delivery and accountability** Enhance the media and civil society organizations, improve public financial management, and foster fiscal decentralization. **6.2 Improving the public financial management framework** It is crucial in this regard to increase the mobilization of domestic resources and enhance the quality of public spending. This will re-duce debt risks, increase credibility in the government, and mobilize external resources under more favorable conditions **6.3 Strengthening security through regional institutions** Strengthen institutions, such as ECOWAS and WAEMU.

3 REGIONAL CHAPTERS

PIDA PROJECTS – WEST AFRICA

ENERGY SECTOR					
Project	Description	Cost ($ millions)	Stage	Countries	REC
Sambagalou	128 MW of hydropower capacity, 930 km from the mouth of the Gambia River to supply Senegal, Guinea, Guinea Bissau and Gambia	300	S3	Senegal, Guinea, Guinea Bissau, Gambia	ECOWAS
West Africa Power Transmission Corridor	2,000 km line along the coast connecting with the existing Ghana–Nigeria line with a capacity of 1,000 MW	1,200	S2	Guinea, Guinea Bissau, Gambia, Sierra Leone, Liberia, Côte d'Ivoire, Ghana	ECOWAS
Nigeria–Algeria Pipeline	4,100 km gas pipeline from Warri to Hassi R'Mel in Algeria for export to Europe		S2	Nigeria, Niger, Algeria	UMA/ ECOWAS
Kaleta	Hydropower generation of 117 MW	179	S3	Guinea	ECOWAS
TRANSPORT SECTOR					
Abidjan-Lagos Coastal Corridor	This seeks to modernize a heavily travelled ARTIN corridor (through trade facilitation, OSBPs, capacity enhancement and implementation of PPP).	290	S3/S4	Nigeria, Benin, Toga, Ghana, Côte d'Ivoire	ECOWAS
Dakar-Niamey Multimodal Corridor	This is designed to modernize a heavily travelled ARTIN corridor (through trade facilitation, OSBPs, capacity enhancement and implementation of PPP).	590	S3/S4	Senegal, Mali, Burkina Faso, Niger	ECOWAS
Praia-Dakar-Abidjan Multimodal Corridor	This program will improve marine transport and connections between island and mainland countries' regional ports, provide a new information system to link the maritime service with ports and roads in the Dakar-Abidjan Corridor, and modernize a heavily travelled ARTIN corridor.	150	S2 to S4	Cape Verde, Senegal, Gambia, Guinea Bissau, Guinea, Sierra Leone, Liberia, Côte d'Ivoire	ECOWAS
Abidjan-Ouagadougou/ Bamako	This program will modernize and rehabilitate the multimodal corridor that suffered during the Côte d'Ivoire civil war.	540	S3/S4	Côte d'Ivoire, Burkina Faso, Mali	ECOWAS
West Africa Hub Port and Rail Programme	This program responds to future capacity problems in ports through a regional port hub with rail links, and the expansion of existing ports.	2,140	S1	All 15 countries	PMAW-CA, ECOWAS
West Africa Air Transport	This program aims at increasing the air transport service levels in West Africa, which are currently limited by the lack of a regional air hub.	420	S1	All 15 countries	ECOWAS
TRANS-BOUNDARY WATER RESOURCES SECTOR					
Forni	Hydropower station in Guinea that will provide irrigation water for Mali and regulate the Niger river, which flows through nine countries.	384	S3	All 10 Niger basin nations	ECOWAS
Gourbassy	Multipurpose dam located in Guinea, involving the regulation of the Senegal river.	NA	S2	Senegal, Guinea	ECOWAS
Noumbiel	A multipurpose dam with hydropower generation (for Burkina Faso and Ghana).	NA	S1/S2	Burkina Faso, Ghana	ECOWAS

WEST AFRICA

3

CASE STUDY WEST AFRICA

As a region, West Africa is the second highest recipient of remittances in the continent, accounting for US $26 billion (of which US $20.9 billion was sent to Nigeria) and amounting to 3.6% of the region's GDP, acording to 2014 figures.

The West Africa diaspora represents approximately 9.1 million people and has become a major source of financing for development in the region. Remittances have grown at a rate of 5% per year on average since 2005. Since 2006, total remittances to West Africa exceeded the total Oversees Development Assistance (ODA) received collectively by the countries in the region. In some countries it even exceeded Foreign Direct Investment (FDI), such as in Senegal where remittances were 5.5 times the FDI in 2014.

REMITTANCES 2014		
Country	% of GDP	US$ Millions
Benin	2.3	216.7
Burkina Faso	1.0	121.5
Cabo Verde	10.2	190.6
Cote d'Ivoire	1.1	378.5
Gambia, The	22.5	191.1
Ghana	5.2	2007.8
Guinea	1.4	94.8
Guinea-Bissau	4.6	46.8
Liberia	24.6	495.2
Mali	7.7	923.4
Niger	1.9	156.8
Nigeria	3.7	20829.2
Senegal	10.5	1643.6
Sierra Leone	1.3	62.4
Togo	7.6	343.2

These financial flows are an untapped opportunity for regional development. Currently remittances serve solely to increase household consumption, and are not channeled to maximize productivity.

There is a tremendous opportunity to expand access to financial services to all remittance recipients, so that they can utilize remittances in a more productive manner.

The simple step of opening a savings account and labeling it for a specific purpose, such as education or health, increases savings by 30%. Further, a savings account allows for an individual to build collateral for housing or business loans.

Hence, government should explore how to link remittances to financial products such as savings devices, access to credit, education accounts, and health insurance. The benefits of remittances could be increased if immigrants were able to use them to hedge against future hardship, rather than relying on them once hardship strikes.

A great example of how financial products can have a positive spillover in the region is the issue of diaspora bonds. These sovereign bonds, aimed at members of the diaspora who wish to contribute to the development of their home countries, are set up by governments to finance major projects. In 2008, Ghana, launched the Golden Jubilee Savings Bond to finance infrastructure projects in each region of the country. The bonds issue allowed the state to raise nearly US $50 million.

2

VOLUME 2

4 HOW TO GET STARTED WITH THE SDGS

HOW TO GET STARTED WITH THE SDGS

VOLUME 2

4

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

With a new era of development comes the need for new approaches to public planning in African countries and across the world. World leaders have historically made promises about sustainable development that have fallen short of being met. The SDGs call for planning methods that effectively incorporate multiple interests, coordinate work across ministries, support the localization of goals, and scale efforts like never before. The SDGs provide an opportunity for leaders to revisit implementation practices and remedy divergence between commitments and results.

Although all stakeholders are responsible for operationalizing the SDGs, African national and city governments will play the leading role in setting priorities and steering progress. Government strategies provide a pathway for sustainable development that directs resources, incentivizes behavior, and guides understanding of complex challenges. Additionally, the use of public planning has changed in response to new global and national realities. Sustainable development now requires long-term planning, protected from political disruption, to address issues like climate change; well-defined responsibilities and accountability mechanisms for multi-stakeholder partnerships; and integrated thinking that puts to rest futile debates that pit one dimension of sustainable development against another.

The following section offers tools and points of reflection for the planning, design, financing, monitoring and reporting of SDG-based strategies at the national and local level throughout Africa. By no means is the information exhaustive, as advancements in implementation are continuously emerging with extensive literature covering such topics. The recommendations are best practices in SDG implementation derived from the UN Sustainable Development Solutions Network's 2015 publication, Getting Started with the Sustainable Development Goals: A Guide for Stakeholders. The recommendations are meant to be used in conjunction with current planning processes, be built upon, and be adapted to meet local contexts.

I. PLANNING

The SDGs are integrated and inclusive. They move away from siloed development approaches, recognizing the interconnectedness between the pillars of sustainable development and the role state and non-state actors play in achieving it. The SDGs encourage countries to benefit from synergies across sectors that naturally build partnerships between ministries, institutions and stakeholders. The public management systems of African governments that are responsible for shepherding this process must adapt their planning and implementation tools to meet these new needs.

4 HOW TO GET STARTED WITH THE SDGS

PLANNING

Implementing integrated development interventions – ones that look at a development problem holistically by taking all relevant sectors into account – requires coordination across ministries and government institutions. Cross-sectoral cooperation like this demands innovative planning instruments to incentivize and organize activity. By and large, African ministries traditionally operate in isolation of one another. The SDGs ask governments to improve collaboration between ministries through shared strategy design, information, communication channels, monitoring systems, technology and human resources.

Similarly, the inclusive nature of the SDGs asks governments to include non-state actors in the planning and implementation process by convening different interest groups in multi-stakeholder consultations. These consultations can be systematically incorporated in the planning process through a formal body of representatives or done ad hoc as needed. Engaging key stakeholders is beneficial to every step of the planning process: it can be used to better understand an aspect of development from a regional, sectoral, or community perspective; to develop a collective agreement on a development goal; to test policy assumptions; and to formally conduct technical reviews.

Strategy design

Although the SDGs call for new approaches to public planning, they do not call for entirely new development strategies. Most African countries have development strategies in place, such as Poverty Eradication Action Plans and Poverty Reduction Strategies, as well as three-to-five year national plans. Countries are encouraged to build on these strategies by aligning them with the SDG framework, in terms of timeline and targets.

Sustainable development will be a long-term transformation. It therefore requires strategies that go beyond the usual three-to-five year political cycles. Building on the success of the MDGs in Africa, SDG strategies should follow a minimum 15-year time scale, and serve as a national roadmap with milestones that guide the design of mid-term plans. Indicators associated with milestones can then be used to monitor the plans' progress through quarterly, bi-annual or annual reviews (see "Monitoring and Review" below for more details).

Backcasting

A best practice in long-term planning for sustainable development is backcasting – "generating a desirable future, and then looking backwards from that future to the present in order to strategize and to plan how it could be achieved (Phillip and Quist, 2011)." In the context of the SDGs, backcasting is a problem-solving framework that envisions where development should be and sets targets to achieve the desired outcome. Unlike forecasting, which anticipates outcomes based on current trends, backcasting begins with a projection of desired outcomes, and works backwards to understand what is needed for their realization.

PLANNING

4

Backcasting steps

Although there are different approaches to backcasting, the process has three primary steps:

STEP 1: ANALYZE CURRENT NATIONAL BASELINES AND POLICY FRAMEWORKS

A baseline is a clearly-defined starting point, in the form of one or more qualitative or quantitative indicators, that represents development progress. Baseline assessments are a valuable tool for policy making as they provide governments with a clear picture of where they stand on various aspects of development at a given time. For a country that is starting to plan for the SDGs, the baseline assessment is the first step towards making sense of where it stands in relation to the SDG agenda.

Additionally, governments should analyze associated policy frameworks, which are generally slower to change, to assess their utility in the context of international standards and the SDGs. This is especially important for more recent development trends such as rapid urbanization and large-scale environmental degradation, which may need new or revised policies and safeguards for better governance.

STEP 2: USE A LONG-TERM VISION FOR SUSTAINABLE DEVELOPMENT AS THE STARTING POINT

A national vision for sustainable development is the starting point from which development pathways are outlined. Ideally the vision represents multiple stakeholders' views on a country's sustainable future. For instance, the African Union's vision statement below defines the purpose of its 50-year, long-term strategy for growth and change and outlines the core values that underpin it. The statement is clear in defining and communicating the organization's Agenda, yet remains sufficiently broad to encompass the national strategies of member states.

African Union's Agenda 2063

"Aiming to encourage discussion among all stakeholders, 'Agenda 2063' is an approach to how the continent should effectively learn from the lessons of the past, build on the progress now underway and strategically exploit all possible opportunities available in the immediate and medium term, so as to ensure a positive socio-economic transformation within the next 50 years."

STEP 3: CREATE A 15-YEAR PLAN FOR SUSTAINABLE DEVELOPMENT

The core of the backcasting exercise is creating a long-term plan that maps out targets, milestones and steps that need to be taken to achieve the vision. The milestones are then translated into a strategy that can be used within ministries and released to the public. By using findings from the baseline and policy assessment in step 1, backcasting helps define what policies, institutional and technical reforms, and partnerships are needed to achieve the 15-year vision.

4 HOW TO GET STARTED WITH THE SDGS

PLANNING

Progressive realization of goals

When designing a 15-year SDG strategy, African countries face trade-offs in achieving the three pillars of development, which often have competing interests. Ending extreme poverty will require significant economic growth, but it cannot come at the expense of the natural environment or well-being of communities. A mindset of "grow now, clean up later" is no longer an option.

Questions arise, such as:

- What can African countries do in the short term to take into account environmental assets and community well-being in their strategies?
- Given short-term political cycles and the concerns of reelection, how do African governments garner support for decisions that may lead to a short-term lull in economic growth, but produce long-term structural changes that will benefit generations to come?
- How can developing countries in sub-Saharan Africa "catch up" with more industrialized nations given today's ecological constraints, when earlier development trajectories did not face such constraints?

Sequencing interventions strategically can help to address trade-off challenges by figuring out what initiatives should come first, at what scale, and in which part of the country. Strategically organizing the order of interventions will not only achieve a sound framework for development but will also capitalize on the synergies between sectoral interventions to ensure that they support each other and have minimal negative effects.

It is often helpful to begin by piloting policies and programs at a smaller-scale before implementing them nation-wide. Testing out an initiative in a smaller context can help to understand it at scale. This provides insight into how the approach resonates in the cultural context, and provides information for decision-makers about best practices for applying the initiative at scale. Pilot programs can be used to understand the impact of policy decisions by testing early outcomes against a counterfactual, such as a control group. They can also be used to assess practical implementation methods to see if service delivery or coordination of actors works effectively and is cost-effective.

II. MONITORING

The success of the SDG Agenda relies on the careful monitoring of progress, which requires African governments to craft robust sets of SDG indicators, build the capacity of their national statistics offices, and capitalize on the data revolution. As recognized in the SDG outcome document, Transforming our world: the 2030 Agenda for Sustainable Development (2015), "quality, accessible, timely and reliable disaggregated data will be needed to help with the measurement of progress and to ensure that no one is left behind. Such data is key to decision-making." The high visibility given to indicators and data collection within the SDG dialogues, and throughout the final outcome document, reflects a major shift in recent years. Key lessons learned from the MDGs underscore the fact that high-quality, disaggregated data is essential to ensure equitable progress against goals and targets; that data will only drive policy and decision-making if it is timely; and that there are sizeable gaps in our knowledge that require a change in the way we collect data and evidence (SDSN, 2015b).

a) Justification for Monitoring and Reporting (M&R)

The MDGs set up an important milestone on data collection in Africa. However, data were intermittently available or delayed in the majority of countries. It was often incomplete and of poor quality, thus making it insufficient as either a reliable governmental management tool or a real-time report card for the achievement of the MDGs.

Benefits of upgrading M&R Systems

1. Decision-making	Data acquired from improved M&R systems can be leveraged to make vital real or near-time decisions, in particular to channel resources to those programs and policies that have evidenced desired outcomes.
2. Accountability	Improved M&R systems can be used to scrutinize performance and the use of budget resources, thereby increasing accountability of public sector activities.
3. Implementation and Managerial Capacity Building	M&R is a research tool with the potential to augment implementation and managerial learning and develop the capacity of local governance. The data gathered should be translated into analytical, action-oriented reports that facilitate effective decision-making.
4. Responsive and Participatory Governance	When M&R findings are made available to a broader audience, they promote transparency by allowing external researchers, donors, and citizens the opportunities to develop research, policy recommendations and technological innovations that can directly strengthen local governance.

Deploying a comprehensive M&R system will synergize investment needs across sectors; investments in data to monitor policies will encourage donations and/or private investment in interventions that have a proven impact and at the same time direct resources to sectors that are lagging behind. The ability to connect disparate datasets for analysis is crucial for providing cost-effective access and high returns on investments made for accelerating growth. While not everything needs to be connected, being able to answer the simplest questions – where people live, where is the infrastructure, what is the current impact of an intervention, where an indicator is lagging behind, etc. – and understand how and over what timeframe these factors relate to each other is crucial to ministries and to government financing and planning units.

Equally important is the need to develop a uniform and central SDG reporting dashboard and platform for the continent that allows governments to track their progress. This means facilitating collaboration and partnership between governments and international agencies that facilitate data collection, such as the UN and the World Bank, to develop new data collection and reporting systems and dashboards. The role of the SDGC/A is not to create a new dashboard or a new set of data; rather, the SDGC/A is keen on building up the capacity of national statistics institutions to produce quality and reliable national data and to regularly report on their SDGs progress.

b) Craft a robust set of SDG indicators

Indicators will be the backbone of how progress towards the SDGs will be monitored, at the local, national, and regional levels. A sound indicator framework will provide a management tool and a report card for progress, as well as a tool for ensuring accountability. African countries will need to develop a set of national indicators that align with context-specific priorities and concerns to help track progress on the SDG agenda. These indicators should build upon existing monitoring methods used by national statistical offices or systems, and should also align with the set of global monitoring indicators currently being devised by the Inter-Agency and Expert Group on SDG Indicators, under the auspices of the Statistical Commission (UNDESA, 2015). The process of devising national indicators needs to start quickly so a baseline is in place to start measuring progress and reporting on implementation within 18 months. Review processes should be conducted in partnership with parliaments, as well as through the global follow-up and review process under the High Level Political Forum. The baseline assessment (described in Strategy Design) provides a good opportunity to kick-start this dialogue and the process of setting the indicators.

4 HOW TO GET STARTED WITH THE SDGS

MONITORING

The UN SDSN's 2015 report Indicators and Monitoring Framework for the Sustainable Development Goals: Launching a Data Revolution offers the following list of recommendations on what effective indicators for SDG monitoring should look like:

- Limited in number and globally harmonized
  SDG indicators should build upon existing data sources and be limited in number. The global set of indicators being developed by the Statistical Commission should provide the starting point, and these should be complemented by as many national indicators as deemed appropriate to cover the countries' specific challenges.

- Simple, single-variable indicators with straightforward policy implications
  Indicators need to be simple to compile and easy to interpret and communicate. They must also have clear policy implications. Composite indices should be avoided where possible since they require more complex data collection methods, and often rely on imputation for missing variables and arbitrary weighting.

- Allow for high frequency monitoring
  Timeliness is crucial for data to be a useful management and policy tool. To align with national planning and budgetary processes, SDG monitoring should operate on an annual cycle, drawing upon indicators that lend themselves to annual production, or bi- or tri-yearly production, with interim annual figures produced using robust estimation methodologies.

- Consensus-based
  In line with international standards and information already collected by national and environmental-economic information systems, indicators should be underpinned by a broad international consensus on their measurement.

- Constructed from well-established data sources
  Indicators should draw on well-established sources of public and private data, and be consistent to enable measurement over time

- Disaggregated
  Preference should be given to indicators that lend themselves to disaggregation in order to track inequalities in SDG achievement. Key dimensions for disaggregation include: characteristics of the individual or household (e.g. sex, age, income, disability, religion, ethnicity and indigenous status); economic activity; and spatial dimensions (e.g. by metropolitan areas, urban and rural, or districts).

- Universal
  This principle relates to the relevance of SDG indicators at multiple scales. When setting indicators at the national level, the indicator should also be relevant at different territorial scales.

- Mainly outcome-focused
  As with SDG targets, it is generally preferable for indicators to track outcomes (or ends) rather than means. Yet the choice between input and outcome measures must be handled pragmatically. In some cases, input metrics can play a critical role in driving and tracking the changes needed for sustainable development.

- Science-based and forward-looking
  The SDGs will cover a 15-year period. Much will change in that time. Indicators must be designed in such a way as to account for these changing global dynamics and to anticipate future changes. The national indicator framework must be flexible and allow for new indicators to replace outdated ones.

- A proxy for broader issues or conditions
  A single indicator cannot measure every aspect of a complex issue, but well-chosen proxy indicators can track broader concepts.

MONITORING

4

The Africa 2030 Peer Review Forum, 24 August 2017, Kigali. Rwanda Organized in partnership with the Japan International Co-operation Agency (JICA), the Peer Review Forum brought together intellectuals including monitoring and evaluation specialists and researchers from across Africa to encourage candid sharing, reflections and feedback on the Africa 2030 Report.

c) Strengthen statistical systems

Collecting a broad range of indicators on sustainable development, at higher frequency and with more attention to quality, requires modernizing statistical systems throughout the African region. Given the breadth and complexity of the SDG Agenda, many different types of data will be required (demographic, economic, social, and environmental) with varying levels of coverage. This calls for investment in infrastructure, Internet connectivity, and ITC technologies. The following table presents a typology or toolkit of key data sources for monitoring the SDGs, and examples of how data instruments can be used for different Goals.

African governments should undertake a comprehensive needs assessment of each of these key data sources, noting the frequency of the associated data, the level of disaggregation, the rigor by comparing it with international estimates and benchmarking against countries with similar socio-economic or geographic characteristics, and by noting annual levels of investment. Improving the quality of government-led statistical systems must be a first order priority, to ensure that countries can track progress on the SDGs and make evidence-based course corrections. The process of conducting a needs assessment must therefore start as soon as possible, in conjunction with the baseline process outlined in the Strategy Design section.

An SDSN-led consortium of groups provides a methodology for conducting such a needs assessment in the report Data for Development: A Needs Assessment for SDG Monitoring and Statistical Capacity Development (2015). This report looks at aggregated costs for 77 International Development Association (IDA) recipient countries, and provides a helpful frame for assessing the kinds of investments that need to be made in all countries. It also provides guidance on recommended frequencies for data collection and key institutional infrastructures, as well as indicative costs for specific data collection methodologies.

d) Capitalize on the data revolution

Official data, including household survey, administrative, and census data, will play a critical role for the foreseeable future in tracking the SDGs and shaping government programs in African countries. But the unprecedented rate of innovation in data collection techniques and technologies, and the capacity to distribute data widely and freely, has expanded the horizon of possibility. The adoption of the SDGs presents a strategic opportunity to build on the momentum of the data revolution and to affect a shift in the way governments and the public sector use data and analytics. The long-term ambition of African countries should be to move towards a more fully developed culture of statistical literacy, and for a more sophisticated government approach to data production, use, analytics, visualization, and communication.

Of particular importance is greater use of georeferenced data, which can now be easily collected through mobile phones, to provide location-specific information on government facilities, water points, and environmental challenges. As one example, the Nigerian Senior Special Advisor to the President on the MDGs, with support from the Earth Institute's Sustainable Engineering Laboratory, developed the Nigeria MDG Information System, an online interactive data platform. Using this system, all government health and education facilities as well as water access points were mapped across Nigeria within a mere two months. The system now reports the latest status of more than 250,000 facilities using data generated with the help of smartphones. Any internet user can now ascertain the status of every facility across the entire country. Other innovative data applications can be found in UN SDSN's **Data for Development: A Needs Assessment for SDG Monitoring and Statistical Capacity Development** 2015 report, such as:

- Satellite imagery
  Used in predicting harvests, disaster response, earth observations and food security situations; monitoring geographic patterns and likely transmission corridors of diseases that have geospatial determinants; measuring population density and the spread of new settlements; and mapping and planning transportation infrastructure.

- Unmanned Aerial Vehicles (UAVs)
  Closer to earth, UAVs are capable of collecting a range of useful measurements with relevance to the full range of the SDG agenda at a minimal cost.

- Crowd-sourcing
  Wide-scale participation in data collection and data processing, with applications in road mapping, land cover classification, human rights monitoring, price tracking, species inventories, and disaster response planning, with new applications unfolding regularly.

- Smart-meters
  The increasing use of smart-metered systems for energy and water distribution, which transmit usage information over communications networks and create novel capabilities to measure and manage service provision.

- Smartphone and tablet-based data collection
  Many surveys are now being conducted on digital mobile platforms. This practice reduces the time and cost of data collection, improves accuracy, simplifies collection of GIS and image data, streamlines integration with other information streams, and opens up the possibility of incorporating micro-chip based sensors into survey processes.

- Data mining
  New uses have been discovered for data sources emerging from processes not explicitly designed for such purposes, such as social media, mobile call data records, commercial transactions, and traffic records. Proven applications have been developed in a range of areas including crisis response, urban planning, and public health management.

MONITORING

4

EXAMPLE TOOLKIT OF KEY DATA SOURCES FOR MONITORING THE SDGS

	GOAL 1: End poverty in all its forms everywhere	GOAL 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture	GOAL 3: Ensure healthy lives and promote well-being for all at all ages	GOAL 6: Ensure availability and sustainable management of water and sanitation for all
Census: Systematic recording of information from all given members of a population	☐	☐	☐	☐
Household Survey: National sample of randomly selected households that provides data on demographic and socioeconomic characteristics	☐	☐	☐	☐
Agricultural Survey Surveys of farms, raches and people who operate related enterprises	☐	☐	☐	☐
Geospatial Data/Infrastructure and Facility Inventories Data with location-specific information (including other data inputs mentioned above) and spatial visualisation including facility inventories and core geographic data layers	☐	☐	☐	☐
Civil Registration and Vital Statistics (CRVS) A form of administrative data that records vital events to a person's life, including birth, marriage, divorce, adoption and death	☐	☐	☐	☐
Administrative Data Information collected primarily for administrative or management purposes, including welfare, taxes and educational record systems, amongst others	☐	☐	☐	☐
Economic Statistics Financial and economic performance measurements, including labor force and establishment surveys, economic performance, employment, taxation, imports and exports, and other industrial activities	☐	☐	☐	☐
Environmental Data Real time monitoring, ground stations, and satellite imagery for a range of invironmental variables, including biodiversity, air quality, water resources, and forest and land use change	☐	☐	☐	☐

4 HOW TO GET STARTED WITH THE SDGS

COUNTRY CASES

III. ASSESSMENT TO IDENTIFY KEY INDICATORS THAT NEED TO BE TRACKED FOR THE ACHIEVEMENT OF THE SDGS – COUNTRY CASES

a) Example SDG indicators for Rwanda

SDG Targets	Proposed Indicators	Data Source	Periodicity	Responsible Stakeholder	Sector
Goal 1. End poverty in all its forms everywhere					
1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day	1.1.1 Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)	EICV/WB Poverty stats	3 years	NISR/World Bank/ MINAFFET	Cross Cutting

b) Example priority targets and the 78 associated indicators for Benin

N°	Name of SDGs targets	SDGs indicators
1	By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	1.2.1 Proportion of population living below the national poverty line, by sex and age 1.2.2 Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions

IV. OVERVIEW OF COUNTRIES' CURRENT CAPACITY ON DATA COLLECTION AND ANALYSIS

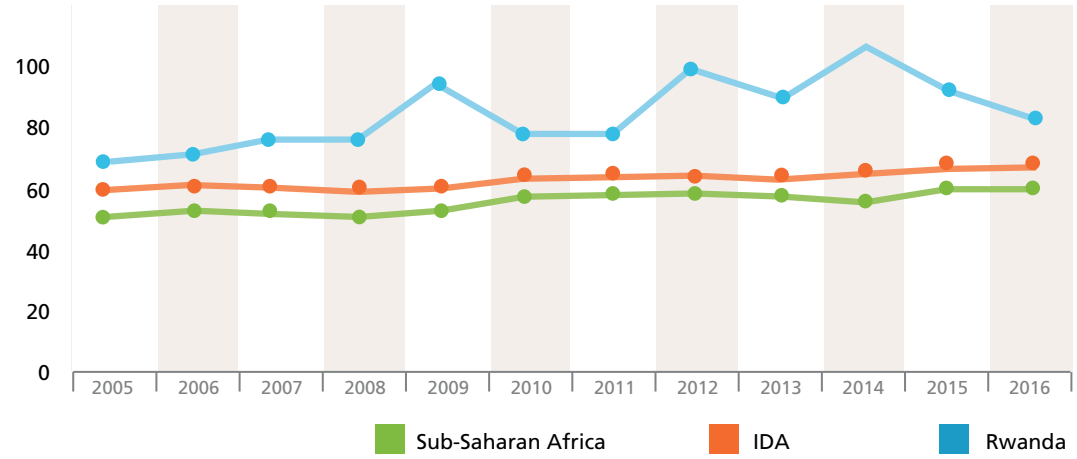
CASE OF RWANDA

The World Bank's Statistical Capacity Indicator (SCI), which provides individual country scores (from 0 to 100) according to statistics systems and capacity, is based on three categories: Methodology, Source Data, and Periodicity. It shows that Rwanda had an average score of 73.33 out of 100 for 3 categories in 2016. Rwanda has a higher capacity to collect, analyze and disseminate high-quality data about its population and economy than sub-Saharan Africa does overall, which has an average score of 59.9. Since 2005, Rwanda has consistently performed better than sub-Saharan Africa in all three areas: Methodology, Source Data and Periodicity. Of the three categories, Rwanda has continued to improve and perform the best in Periodicity, reporting frequently on 10 social and economic indicators. Its Source Data has significantly improved since 2008. However, Rwanda still lacks a vital registration system, which is key in monitoring and reporting demographic indicators. Lastly, there is still a lot of room for improvement and consistency in its Methodology but it is evident that Rwanda is making efforts and improving.

COUNTRY CASES

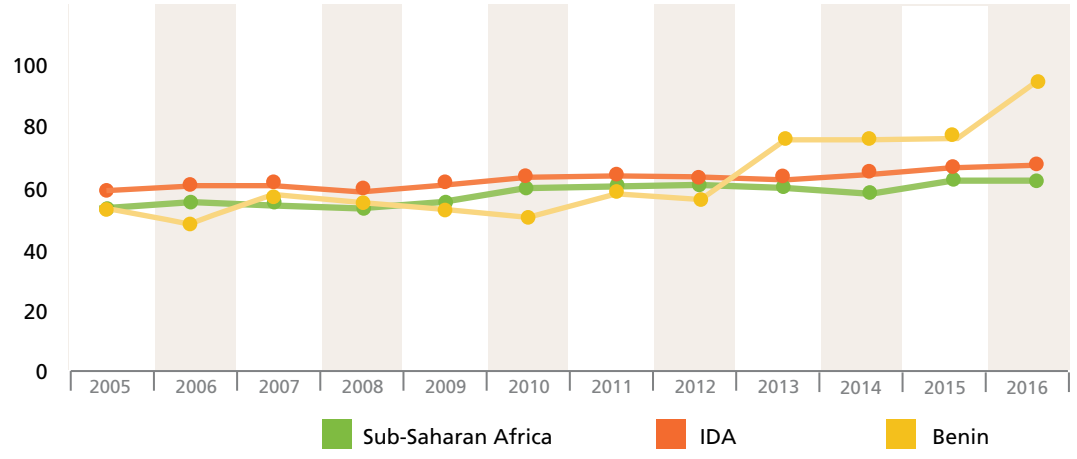
4

RWANDA: OVERALL SCORE



Source: World Bank 2016.

BENIN: OVERALL STATISTICAL CAPACITY INDICATORSCORE 2016



Source: World Bank 2016.

4 HOW TO GET STARTED WITH THE SDGS

COUNTRY CASES

The Government of Rwanda has completed a gap analysis to assess its readiness to implement the SDGs. In addition to identifying policy level gaps, the analysis comprehensively reviewed the existing data collection systems of the Rwanda National Statistical Systems to identify data gaps and requirements to ensure effective and reliable data collection and reporting on the SDGs. Some of the findings include identifying low or no cost opportunities to increase the capacity of the National Institute of Statistics of Rwanda (NISR) to track some of the SDG indicators.

Additionally, the analysis found that data for 101 indicators are not available and require strengthening or new systems for data gathering. The Government currently has offers of support to increase national capacity for data collection and analysis from a number of international organizations including One UN in Rwanda and the SDGC/A.

CASE OF BENIN

The World Bank's Statistical Capacity Indicator (SCI), shows how Benin, despite being above sub-Saharan Africa in general, is lagging behind in statistical capacity in comparison to the world. It scored 75 in the indicator and, as the graph shows, its statistical capacity has improved steadily over the past 10 years.

The success of the SDG Agenda depends heavily on efficient and robust monitoring of its progress. Hence, Benin and all African nations must have in place quality, accessible, timely and reliable disaggregated data, in order to measure progress, ensure accountability and achieve the goals by 2030.

Data gathering systems/methods in Benin are still based on traditional paper methods of data collection and processes that are inefficient and costly. As a result, government data are usually out of date by the time they are released, making it difficult for policy makers to adequately plan for and allocate necessary resources to achieve development targets.

The government of Benin has completed the SDG target prioritization process. This process was supported by the SDG Center and the UNDP. The process was catalyzed by the Regulatory Impact Assessment 1 and 2 (RIA 1 & 2), tools that aimed to align the national development plans with the SDG targets.

This process identified the SDG targets and indicators that are compatible with the national priorities. All relevant stakeholders participated – government, development partners, civil society and the private sector. The analysis was divided into 4 groups, with the relevant SDG goals associated to each: social (SDG 1-6), economic (SDG 7-11), environmental (SDG 12-15) and institutional (SDG 16).

This prioritization of the targets followed a methodology that selected them using the following filters:

Filter 1

- Mandatory SDG targets
- Correspondent MDG targets that were not achieved
- Transformational targets (universal accelerators such as gender, youth and energy issues)
- Targets related to several dimensions of sustainable development

Filter 2

- Targets related to international partnership and engagement
- Targets directly related to poverty eradication and social exclusion
- Targets related to other national priorities

Filter 3

- Existence of metrics and/or the possibility of measuring it feasibly
- Targets that can be measured in a disaggregated manner

MONITORING AND REPORTING TOOLS

4

Given the resources availabile for tracking and implementing all targets, it was decided that

- For every goal with three targets at least one must be prioritized
- For every goal with 4-6 targets at least two need to be prioritized
- For every goal with more than 6 targets at least 3 need to be prioritized

As a result of this process 48 targets were selected that are associated with 78 SDG indicators. After this, the process of incorporating the SGD targets into the domestic Government Action Plan (PAG), which is the official framework for public policy in the 2016-2025 development agenda, took place.

V. MONITORING AND REPORTING TOOLS: INDEX, DASHBOARD, DATA VISUALIZATION & CITIZENS' REPORT

The Sustainable Development Solutions Network (SDSN) and Bertelsmann Stiftung developed the SDG Index & Dashboard to provide a report card for tracking SDG progress and ensuring accountability by informing governments, businesses, and civil society of each country's SDG progress. The tool, comprised of an Index and Dashboard, helps countries understand their overall standing and performance in relation to the SDGs, other countries and the region, assesses their performance by each SDG, and identifies priorities for action and gaps.

The initial status of each country is based on data as close to 2015 as available. The Index and Dashboards will be updated annually over the next three years to include new indicators, update data and to reflect improvements on the tools.

Both SDG Dashboards and the SDG Index are designed to support national discussions on operationalizing the SDGs instead of monitoring progress towards achieving them. Although the index and dashboard were constructed with data that is not completely updated, both tools serve to identify a baseline for SDGs assessment, to identify where the substantial gaps are and where policy and resources need to be directed.

The second edition of the SDG Index and Dashboards Report 2017 analyzes the development patterns of rich countries to show how they generate "spillovers" that may hinder the ability of poorer countries to achieve the SDGs. Many of the adverse spillovers tend to be neglected or poorly measured in official development statistics. The 2017 SDG Index and Dashboards Report therefore reviews the scientific and policy literature to identify the best available data for quantifying such complex spillovers.

While the global SDG Index and Dashboards Report focuses on all nations, the SDGC/A will be producing the Africa SDG Index and Dashboards Report every year. This report will focus only on African nations and will feed into the annual global version. It is the Center's intention that country level reports can come out of the Africa SDG Index and Dashboards Reports.

SDG Index

The SDG Index is a composite index that helps countries to benchmark themselves using a single holistic measure that encompasses all SDGs and treats each goal equally. It helps every country to understand their overall standing and performance in relation to the SDGs and other countries and the region; to assess their performance by each SDG; to identify priorities for action; and to understand the key implementation challenges and detect gaps. It uses data that are currently available and fills data gaps with metrics from internationally reputable sources. It presents the data in an easy-to-use format to help countries establish baselines for the SDGs and to identify priorities for action across the 17 Goals.

4 HOW TO GET STARTED WITH THE SDGS

The SDG Index ranks countries according to their initial status on the 17 SDGs. It is important to underline that this data set is only part of the data that should be used to properly monitor the SDGs.

Using the SDG Index, countries can also assess their progress relative to the "best" possible scores on the various indicators. Both the country's score for each of the 17 goals and the overall Index score can be understood as the country's position between the worst (0) and best (100) cases. For example, Sweden's overall index score is 84.5, meaning that Sweden is on average 84.5% of the way to achieving the best possible outcomes across the 17 SDGs.

SDG Dashboard

A snapshot of the countries' current status in achieving each goal is represented using a color-coded scheme. The three colors, green, yellow and red, are assigned to each goal and indicative of the current situation.

Green for a particular indicator means that a country is on track to achieve an SDG and reach its targets, or has (in some cases) already achieved the threshold consistent with achieving the SDG. Red signifies that a country has challenges in meeting the targets and achieving the SDG. Yellow means that a country is making progress.

The colored scheme is based on four quantitative thresholds: best and worst scores (same as the SDG Index methodology), the threshold for SDG achievement, and the threshold between a red and yellow color rating (see Annex 2 for description of quantitative thresholds.). The green band is bounded by the maximum possible score for each variable and the threshold for achieving the SDG; yellow is bounded by the threshold for achieving an SDG at the top and a threshold denoting significant challenges in achieving the Goal; and red is bounded at the bottom by a threshold denoting worst performance in the sample.

Illustrations of the Country SDG Index and Dashboard

This report highlights the SDG Index and Dashboard for Rwanda and Benin. The Index and Dashboard, detailed metadata, and the quantitative thresholds used for each indicator for other countries can be accessed online at www.sdgindex.org.

Country has challenges in meeting the targets and achieving the SDG.

Country is making progress in achieving the SDG.

Country is on track to achieve an SDG and reach its targets or has already achieved the target.

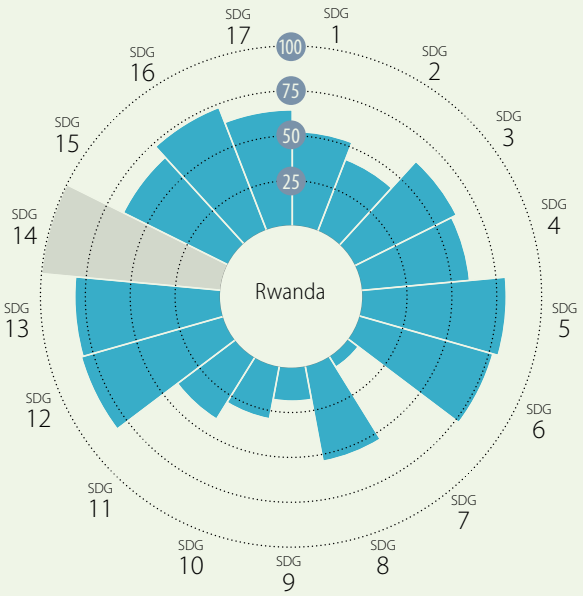
RWANDA

OVERALL SDG PERFORMANCE	Global rank	Score or value	Regional average
SDG Index	122 (of 149)	55	51.4

Comparison with other development metrics

GDP per capita, PPP (2015)	138/153	US$ 1,655	US$ 4,103
Subjective Wellbeing (2016)	131/133	33	41
Environmental Performance Index (2016)	131/157	50.3	52.8
Human Development Index (2016)	132/157	49.8	50.6
Global Competitiveness Index (2016/17)	50/134	63.0	51.4
Global Peace Index (2016)	120/149	53.5	56.5

AVERAGE PERFORMANCE BY SDG



Source: SDG Index and Dashboards - Global Report, 2016.

4 HOW TO GET STARTED WITH THE SDGS

RWANDA

SDG DASHBOARD

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

As evidenced in the SDG Dashboard, Rwanda is on track to achieve SDG 17, Partnerships for the Goals, but is experiencing difficulties in achieving the other 15 SDGs. SDG 14, Life Below Water, does not apply to Rwanda. The following table illustrates in greater detail Rwanda's progress on certain indicators for each goal. While Rwanda may perform well in some individual indicators for a goal, the Dashboard reflects Rwanda's overall progress.

Source: SDG Index and Dashboards - Global Report, 2016.

RWANDA

PERFORMANCE BY INDICATOR

Indicator	Value	Rating
SDG1		
Poverty headcount ratio at $1.90/day (% population)	49.2	🔴
Projected poverty headcount ratio at $1.90/day in 2030 (% population)	18.8	🔴
SDG2		
Prevalence of undernourishment (% population)	31.6	🔴
Prevalence of stunting (low height-for-age) in children under 5 years of age (%)	44.3	🔴
Prevalence of wasting in children under 5 years of age (%)	3	🟢
Prevalence of obesity, BMI ≥ 30 (% adult population)	4	🟢
Cereal yield (t/ha)	1.9	🟡
Sustainable Nitrogen Management Index	0.8	🔴
SDG3		
Maternal mortality rate (per 100,000 live births)	290	🔴
Neonatal mortality rate (per 1,000 live births)	18.7	🔴
Mortality rate, under-5 (per 1,000 live births)	41.7	🟡
Incidence of tuberculosis (per 100,000 people)	56	🟡
HIV prevalence (per 1,000)	1.2	🔴
Age-standardised death rate due to cardiovascular disease, cancer, diabetes, and chronic respiratory disease in populations age 30–70 years, per 100,000 population	19.1	🟡
Age-standardised death rate attributable to household air pollution and ambient air pollution, per 100,000 population	121.1	🔴
Traffic deaths rate (per 100,000 people)	32.1	🔴
Healthy Life Expectancy at birth (years)	56.6	🔴
Adolescent fertility rate (births per 1,000 women ages 15-19)	25.6	🟡
Proportion of births attended by skilled health personnel	90.7	🟡
Percentage of surviving infants who received 2 WHO-recommended vaccines (%)	97	🟢
Universal Health Coverage Tracer Index (0-100)	74.8	🟡
Subjective Wellbeing (average ladder score, 0-10)	3.3	🔴
SDG4		
Net primary enrolment rate (%)	96.2	🟡
Expected years of schooling (years)	3.8	🔴
Literacy rate of 15-24 year olds, both sexes (%)	85	🟡
SDG5		
Estimated demand for contraception that is unmet (% women married or in union, ages 15-49)	35.7	🟡
Ratio of female to male mean years of schooling of population age 25 and above	75.8	🟡
Ratio of female to male labor force participation rate	101.3	🟢
Proportion of seats held by women in national parliaments (%)	63.8	🟢
SDG6		
Access to improved water source (% population)	76.1	🔴
Access to improved sanitation facilities (% population)	61.6	🔴
Freshwater withdrawal as % total renewable water resources	1.1	🟢
Imported groundwater depletion (m^3/year/capita)	2.3	🟢
SDG7		
Access to electricity (% population)	19.8	🔴
Access to non-solid fuels (% population)	2	🔴
CO_2 emissions from fuel combustion / electricity output ($MtCO_2$/TWh)	na	⚫
SDG8		
Adjusted GDP Growth (%)	-5.2	🔴
Percentage of children 5–14 years old involved in child labor	28.5	🔴
Adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider (%)	54.9	🟡
Unemployment rate (% total labor force)	2.5	🟢
SDG9		
Proportion of the population using the internet (%)	18	🔴
Mobile broadband subscriptions (per 100 inhabitants)	25.9	🔴

Indicator	Value	Rating
Quality of overall infrastructure (1= extremely underdeveloped; 7= extensive and efficient by international standards)	4.6	🟢
Logistics performance index: Quality of trade and transport-related infrastructure (1=low to 5=high)	2.4	🟡
QS University Ranking, Average score of top 3 universities (0-100)	0	🟡
Number of scientific and technical journal articles (per capita)	0	🔴
Research and development expenditure (% GDP)	0	🔴
SDG10		
Gini index (0-100)	50.4	🔴
SDG11		
Annual mean concentration of particulate matter of less than 2.5 microns of diameter (PM2.5) in urban areas ($\mu g/m^3$)	41.3	🔴
Improved water source, piped (% urban population with access)	27.8	🔴
SDG12		
Municipal Solid Waste (kg/year/capita)	0.5	🟢
E-waste generated (kg/capita)	0.6	🟢
Percentage of anthropogenic wastewater that receives treatment (%)	0	🔴
Production-based SO_2 emissions (kg/capita)	1.1	🟢
Net imported SO_2 emissions (kg/capita)	0.6	🟢
Reactive nitrogen production footprint (kg/capita)	9.5	🟡
Net imported emissions of reactive nitrogen (kg/capita)	3.7	🟡
SDG13		
Energy-related CO_2 emissions per capita (tCO_2/capita)	0.1	🟢
Imported CO_2 emissions, technology-adjusted (tCO_2/capita)	0.1	🟢
Climate Change Vulnerability Index	0.2	🟡
SDG14		
Mean area that is protected in marine sites important to biodiversity (%)	na	⚫
Ocean Health Index - Biodiversity (0-100)	na	⚫
Ocean Health Index - Clean Waters (0-100)	na	⚫
Ocean Health Index - Fisheries (0-100)	na	⚫
Percentage of Fish Stocks overexploited or collapsed by EEZ (%)	na	⚫
SDG15		
Mean area that is protected in terrestrial sites important to biodiversity (%)	45.7	🟡
Mean area that is protected in freshwater sites important to biodiversity (%)	47.8	🟡
Red List Index of species survival (0-1)	0.8	🟡
Annual change in forest area (%)	3.9	🟡
Imported biodiversity impacts (species lost per million people)	0	🟢
SDG16		
Homicides (per 100,000 people)	4.9	🔴
Prison population (per 100,000 people)	434	🔴
Proportion of the population who feel safe walking alone at night in the city or area where they live (%)	87	🟢
Government Efficiency (1-7)	5.5	🟢
Property Rights (1-7)	5.6	🟢
Proportion of children under 5 years of age whose births have been registered with a civil authority, by age (%)	63.2	🔴
Corruption Perception Index (0-100)	54	🟡
Slavery score (0-100)	50	🟡
Transfers of major conventional weapons (exports) (constant 1990 US$ million per 100,000 people)	0	🟢
SDG17		
Government Health and Education spending (% GDP)	12.6	🟡
For high-income and all OECD DAC countries: International concessional public finance, including official development assistance (% GNI)	na	⚫
For all other countries: Tax revenue (% GDP)	14	🔴
Tax Haven Score (best 0-5 worst)	0	🟢

Source: SDG Index and Dashboards - Global Report, 2016.

4 HOW TO GET STARTED WITH THE SDGS

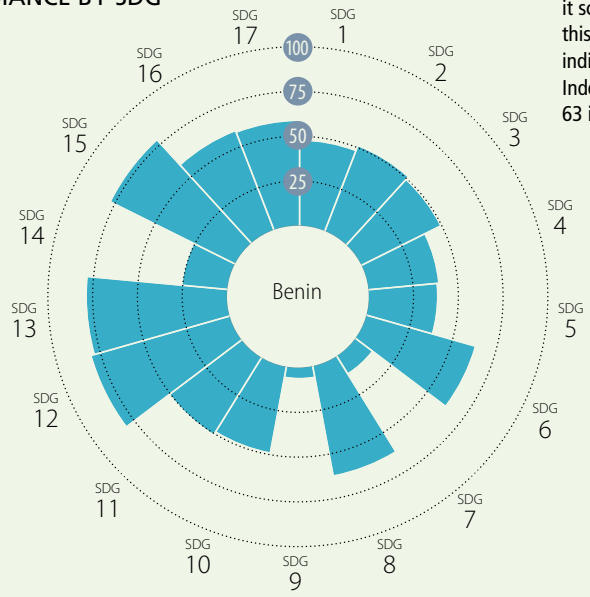
BENIN

OVERALL SDG PERFORMANCE	Global rank	Score or value	Regional average
SDG Index	130 (of 149)*	49.5	51.4

Comparison with other development metrics

GDP per capita, PPP (2015)	133/153	US$ 1,932	US$ 4,103
Subjective Wellbeing (2016)	116/133	40	41
Environmental Performance Index (2016)	145/157	43.7	52.8
Human Development Index (2016)	139/157	48.5	50.6
Global Competitiveness Index (2016/17)	120/134	49.6	51.4
Global Peace Index (2016)	68/149	60.0	56.5

AVERAGE PERFORMANCE BY SDG



*Benin's global ranking is low, at 130 out of 149, and it scores higher than only 16 other African nations. If this result is looked at in detail, taking account of the individual indicators that link the Dashboard and the Index, Benin is only on track (green) in 7 out of the total 63 indicators.

Source: SDG Index and Dashboards - Global Report, 2016.

COUNTRY CASES

4

BENIN

SDG DASHBOARD

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
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17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

The Dashboard is a proxy for an SDG baseline, underlining the urgency for most sub-Saharan countries to accelerate the implementation of SDG policies. For Benin, 14 out of the 17 goals pose serious challenges to their 2030 achievement; according to the SDG Index data, only three goals are in the yellow (mid) range.

Source: SDG Index and Dashboards - Global Report, 2016.

4 HOW TO GET STARTED WITH THE SDGS

BENIN

PERFORMANCE BY INDICATOR

Indicator	Value	Rating
SDG1		
Poverty headcount ratio at $1.90/day (% population)	48.1	
Projected poverty headcount ratio at $1.90/day in 2030 (% population)	27.2	
SDG2		
Prevalence of undernourishment (% population)	7.5	
Prevalence of stunting (low height-for-age) in children under 5 years of age (%)	34	
Prevalence of wasting in children under 5 years of age (%)	4.5	
Prevalence of obesity, BMI ≥ 30 (% adult population)	9.3	
Cereal yield (t/ha)	1.5	
Sustainable Nitrogen Management Index	0.9	
SDG3		
Maternal mortality rate (per 100,000 live births)	405	
Neonatal mortality rate (per 1,000 live births)	31.8	
Mortality rate, under-5 (per 1,000 live births)	99.5	
Incidence of tuberculosis (per 100,000 people)	60	
HIV prevalence (per 1,000)	0.7	
Age-standardised death rate due to cardiovascular disease, cancer, diabetes, and chronic respiratory disease in populations age 30–70 years, per 100,000 population	22.1	
Age-standardised death rate attributable to household air pollution and ambient air pollution, per 100,000 population	92	
Traffic deaths rate (per 100,000 people)	27.7	
Healthy Life Expectancy at birth (years)	52.5	
Adolescent fertility rate (births per 1,000 women ages 15-19)	81.8	
Proportion of births attended by skilled health personnel	77.2	
Percentage of surviving infants who received 2 WHO-recommended vaccines (%)	75	
Universal Health Coverage Tracer Index (0-100)	64.3	
Subjective Wellbeing (average ladder score, 0-10)	4	
SDG4		
Net primary enrolment rate (%)	95.9	
Expected years of schooling (years)	3.5	
Literacy rate of 15-24 year olds, both sexes (%)	52.5	
SDG5		
Estimated demand for contraception that is unmet (% women married or in union, ages 15-49)	78.2	
Ratio of female to male mean years of schooling of population age 25 and above	66.7	
Ratio of female to male labor force participation rate	86.6	
Proportion of seats held by women in national parliaments (%)	7.2	
SDG6		
Access to improved water source (% population)	77.9	
Access to improved sanitation facilities (% population)	19.7	
Freshwater withdrawal as % total renewable water resources	0.5	
Imported groundwater depletion (m^3/year/capita)	7.1	
SDG7		
Access to electricity (% population)	34.1	
Access to non-solid fuels (% population)	6.2	
CO_2 emissions from fuel combustion / electricity output ($MtCO_2$/TWh)	28.7	
SDG8		
Adjusted GDP Growth (%)	3.2	
Percentage of children 5–14 years old involved in child labor	15.3	
Adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider (%)	19.9	
Unemployment rate (% total labor force)	1	
SDG9		
Proportion of the population using the internet (%)	6.8	
Mobile broadband subscriptions (per 100 inhabitants)	4.2	

Indicator	Value	Rating
Quality of overall infrastructure (1= extremely underdeveloped; 7= extensive and efficient by international standards)	2.4	
Logistics performance index: Quality of trade and transport-related infrastructure (1=low to 5=high)	2.4	
QS University Ranking, Average score of top 3 universities (0-100)	0	
Number of scientific and technical journal articles (per capita)	0	
Research and development expenditure (% GDP)	0	
SDG10		
Gini index (0-100)	43.4	
SDG11		
Annual mean concentration of particulate matter of less than 2.5 microns of diameter (PM2.5) in urban areas ($\mu g/m^3$)	29.1	
Improved water source, piped (% urban population with access)	34.2	
SDG12		
Municipal Solid Waste (kg/year/capita)	0.5	
E-waste generated (kg/capita)	0.9	
Percentage of anthropogenic wastewater that receives treatment (%)	0	
Production-based SO_2 emissions (kg/capita)	0.8	
Net imported SO_2 emissions (kg/capita)	0.7	
Reactive nitrogen production footprint (kg/capita)	13.7	
Net imported emissions of reactive nitrogen (kg/capita)	-23.7	
SDG13		
Energy-related CO_2 emissions per capita (tCO_2/capita)	0.6	
Imported CO_2 emissions, technology-adjusted (tCO_2/capita)	0.2	
Climate Change Vulnerability Index	0.2	
SDG14		
Mean area that is protected in marine sites important to biodiversity (%)	30.6	
Ocean Health Index - Biodiversity (0-100)	88.6	
Ocean Health Index - Clean Waters (0-100)	28.9	
Ocean Health Index - Fisheries (0-100)	37.7	
Percentage of Fish Stocks overexploited or collapsed by EEZ (%)	na	
SDG15		
Mean area that is protected in terrestrial sites important to biodiversity (%)	77.4	
Mean area that is protected in freshwater sites important to biodiversity (%)	na	
Red List Index of species survival (0-1)	0.9	
Annual change in forest area (%)	na	
Imported biodiversity impacts (species lost per million people)	0.2	
SDG16		
Homicides (per 100,000 people)	6.3	
Prison population (per 100,000 people)	77	
Proportion of the population who feel safe walking alone at night in the city or area where they live (%)	47	
Government Efficiency (1-7)	3.4	
Property Rights (1-7)	3.8	
Proportion of children under 5 years of age whose births have been registered with a civil authority, by age (%)	84.8	
Corruption Perception Index (0-100)	36	
Slavery score (0-100)	80	
Transfers of major conventional weapons (exports) (constant 1990 US$ million per 100,000 people)	0	
SDG17		
Government Health and Education spending (% GDP)	9	
For high-income and all OECD DAC countries: International concessional public finance, including official development assistance (% GNI)	na	
For all other countries: Tax revenue (% GDP)	15.4	
Tax Haven Score (best 0-5 worst)	0	

Source: SDG Index and Dashboards - Global Report, 2016.

CITIZENS' REPORT

4

VI. CITIZENS' REPORT

A key feature of the SDGs is inclusiveness. This is evident in the comprehensive nature of the goals and the stakeholders and beneficiaries involved. However, this does not necessarily translate into a uniform, universal understanding of the SDGs across all sectors and groups in society. As such, it is important for SDG indices to be simple and easily comprehensible for all citizens, literate and illiterate alike, in African countries.

The SDG Citizens' Report is an initiative of the SDGC/A to promote inclusiveness and accountability of the SDGs through community engagement and mobilization and to identify the policy areas where major progress is needed at the national level. It employs a comprehensive approach to embrace all the agendas of sustainable development, ensuring the sharing of ownership, dividends and responsibilities with all segments of society, and securing meaningful engagement.

The Citizens' Report takes the SDGs and the results and findings from the SDG Africa Index Report and conveys them to communities, especially the 30-40% of society who are illiterate, through different mediums and platforms. It is a tool to help African citizens hold their government and national stakeholders accountable for the promises they make and actions they take towards attaining economic development, social inclusion, environmental sustainability and good governance.

These efforts are complemented by different forms of programming and community outreach through consultation and partnership with Civil Society Organizations (CSOs). Sharing information with communities and villages will facilitate understanding, dialogue and feedback regarding the SDGs, progress and achievements, and bring a synergy to the needs and plans of local communities and higher levels of government.

Community outreach will include awareness campaigns, radio programs, capacity building, and local events. Awareness campaigns will create mainstream information about the significance of the SDGs and the results of the SDG Citizens' Report, including radio programs and pamphlets with visuals to overcome literacy barriers. Capacity building will include workshops and training for citizens to become SDG leaders within their community, to take the information from the Report and design and implement local engagement and dissemination projects. Local events will be used to celebrate successes and draw support for future work, such as an annual SDG Week at the local and national level to connect government with grassroots levels.

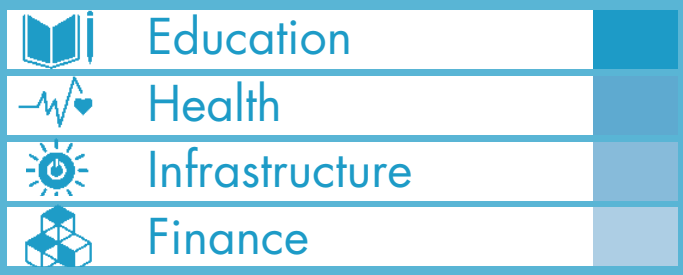
Citizen engagement is key to the success of the SDGs. By treating citizens as equal stakeholders in SDGs planning and implementation, both communities and governments benefit. Communities will benefit from increased information about their country's development and increased capacity to participate in development while governments benefit from increased trust and engagement among citizens at all levels.

THE SDG CITIZENS' REPORT WILL:

1. Be presented in a useful and visual format that will enhance the efficacy of SDGs.
2. Be easily comparable across African countries.
3. Increase citizen engagement in and excitement about the use of SDG data.
4. Generate standardized SDG citizen indices across Africa to enable comparability among countries and among citizens.

VOLUME 2

5 INVESTMENT ASSESSMENT



5 INVESTMENT ASSESSMENT

A secondary school electrified with solar energy - Western Region, Uganda. Photo © SDGC Africa/Gordon C. Shaw.

In an effort to transform the SDGs Agenda into practical investment action plans, the SDG Center has developed costing templates to support national governments in gaining a better understanding of the domestic and international resources needed to achieve the SDGs by 2030. These templates are meant to be customized by each country and adapted to their national plans, interventions and needs. This tool intends to provide governments with guidelines to estimate what investment amounts may be needed to achieve the SDGs related to education, health and infrastructure, specifically energy and roads. These estimates will give governments a sense of where they are financially and enable them to devise a strategy to close the funding gap. The cost will vary from country to country depending on their population size, needs and investment strategy.

A costing model for each sector is being developed based on a rigorous literature review of published studies and reports that have attempted to cost the achievement of the SDGs. Since education and health are compulsory sectors that require government funding, initial costing templates have been developed for these two sectors. Tools have also been developed for energy and roads, but a template for agriculture is still forthcoming.

It is important to state upfront that it is not the intention of the SDGC/A to impose or dictate what sovereign governments ought to do. Rather, the Center recognizes and respects the autonomy of each nation and their capacity to make rational decisions. We hope that this tool can aid and guide in the strategic planning process as governments are devising their national plan and budget. Additionally, the cost estimates from the sample cases are likely not exact figures, as we do not have complete information. However, as countries customize and fill in the templates with more complete information, a more exact cost is likely to surface.

Lastly, though the total cost may appear daunting and unattainable, we hope that governments will seize this as an opportunity to secure investment partners and to incorporate and implement cost-effective and impactful interventions. The following chapter will provide greater details on how to finance the SDGs. Please see Annex III for samples of each costing template.

5 INVESTMENT ASSESSMENT

I. EDUCATION

Summary

For education, the most comprehensive study is "The Learning Generation, Investing in Education for a Changing World", a report by The International Commission on Financing Global Education Opportunity. The model is built on the UNESCO 2015 costing model, which was developed to estimate the costs of reaching the SDGs and the associated finance gaps. The Commission added to the model the inclusion of more countries and projections for upper-secondary level.

The model aims to identify the investment needs required to achieve good quality, equitable and universal pre-primary, primary, lower and upper-secondary education. It quantifies the cost to reach the above targets, specifies how much national governments need to raise their education expenditure for the targets to be achieved, and calculates the gap between the cost and national education expenditure that will need to be filled with external financing methods. Costs include the sum of teachers' salaries, other recurrent costs, capital investments, and support for marginalized students.

Results

By 2030, low-income countries will be home to nearly a fifth of the world's school-age children (3-18). In low-income countries alone, the report projects that total public and private spending will need to almost double to achieve the education targets. This will not be achievable without significant international support (which will cover about half of total education costs) as well as some continued spending at upper-secondary level by households.

The number of secondary students in low-income countries is projected to increase from 29 million in 2012 to 70 million in 2030. The average annual growth rate in secondary pupils would be 6.9% – more than one and a half times higher than the average growth seen since 2000 in countries with comparable secondary enrollment rates. Even faster growth is projected for pre-school and upper-secondary enrollment in low-income countries: pre-school pupils are projected to rise from 5 million to 28 million by 2030 and upper-secondary students from 18 million to 82 million by 2030.

NUMBER OF STUDENTS (MILLIONS) BY LEVEL, IN LOW INCOME COUNTRIES

	2012	2030
Pre-primary	5	28
Primary	127	163
Secondary	29	70
Upper-secondary	18	82

Source: Education Commission costing model (2016).

In low-income countries, per-pupil costs will be $218 for primary and $347 for secondary students by 2030. The higher secondary level costs are due to the relatively lower pupil to teacher ratios, higher teachers' salaries, and a greater need for classroom construction at the secondary level. Expenditure per student will grow considerably as a result of efforts to improve quality. Overall expenditure per student in sub-Saharan Africa will need to more than double for pre-primary (from US$ 389 to US$ 831), nearly double in primary education (from US$ 242 to US$ 392) and increase from US$ 613 to US$ 715 for secondary.

EXPENDITURE PER STUDENT (US$) BY LEVEL

	Low Income		Sub-Saharan Africa	
	2015	2030	2015	2030
Pre-primary	116	486	389	831
Primary	90	218	242	392
Secondary	258	347	613	715
Upper-secondary	1,634	1,759	2,892	2,887

Source: Education Commission costing model (2016).
Note: All costs are in 2014 dollars.

EDUCATION

5

The annual total cost of universal pre-primary, primary, secondary and upper-secondary education in low-income countries globally is projected to almost quadruple, from US$ 27 billion in 2015 to US$ 102 billion in 2030. In sub-Sahara African, the financing pressures are even greater given population trends. The annual total costs for the four education levels are projected to triple, from US$ 115 billion in 2015 to US$ 327 billion in 2030.

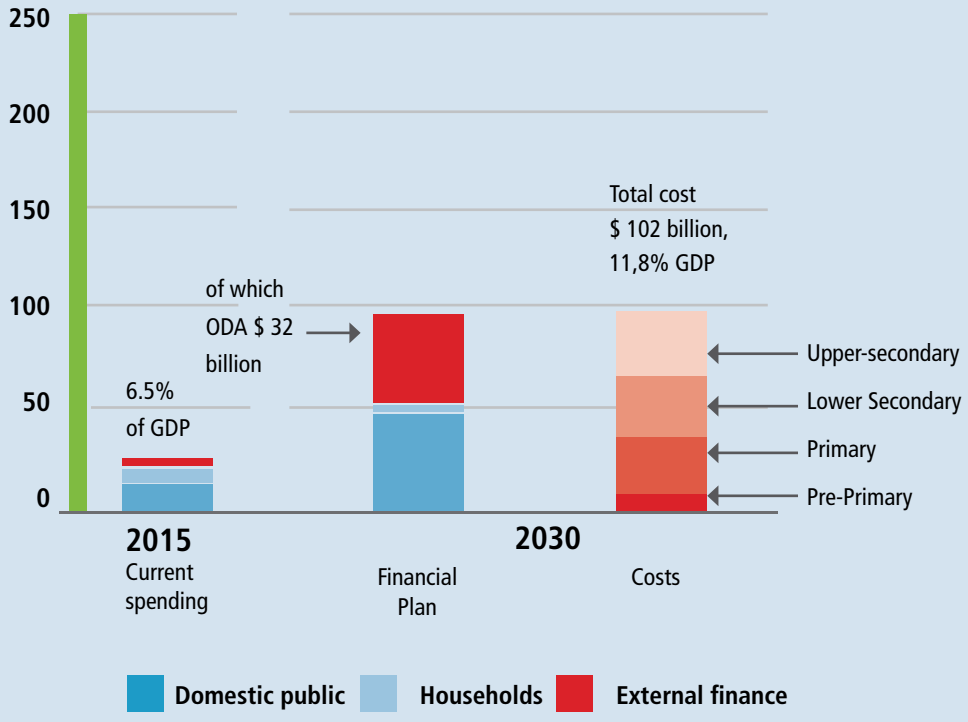
To meet the education targets by 2030, 50% of the total cost will need to come from domestic spending that is expected to rise as a consequence of economic growth – higher GDP levels, tax revenues and education prioritization in the national budgets. Another 5.8% will come from households, and the remaining 44.2% will need to come from external finance. The total average external finance needed for 2015-2030 for low-income countries is US$ 21 billion dollars.

Methodology

It is assumed that domestic budgets plus external resources are sufficient to cover the costs of education expansion. The main source of funding is domestic budgets, but in a number of countries, even with assumptions about higher public funding of basic education, finance gaps remain. If the external funding is not available, the education paths projected will not be possible. The model uses an education expenditure function – a product of pupil to teacher ratios, enrollment rates and teachers' salaries, that was built with data from 82 low and lower-middle income countries.

FINANCIAL GAP AND TOTAL COST

Low-income countries: $ billion, constant 2014 prices



Source: Education Commission Analysis (2016).

5 INVESTMENT ASSESSMENT

EDUCATION

SDG 4 calls to

"Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all."

SDG4 comprehensively covers access, quality and equity in education by assuming:

Access

- Universal pre-school access – a gross enrollment rate of 100% by 2030.
- Universal primary and lower secondary education completion – all children and adolescents are completing both primary and lower-secondary school by 2030.

Quality

- Quality of preschool, primary and lower-secondary education is raised to standards that are conducive to learning with high rates of progression, namely:
  1. Pupil-teacher ratios (PTR) to reach levels that have been shown to be necessary for a minimum standard of learning. By 2030, primary PTR will be a maximum of 40:1 but, in countries where income and domestic resources allow, lower levels are projected because it has been observed that as income and education resources rise, countries tend to provide more teachers and classrooms as a way to further enhance education quality.
  2. The provision of classrooms so that there is a classroom for every teacher (pupil classroom ratio = PTR) and there are schools near all children. The assumed costs of classrooms include the purchase of furniture and annual maintenance of existing classrooms to maintain quality.
  3. Support the recruitment of talented and motivated teachers by providing adequate salaries.
  4. Provide sufficient learning materials and administrative support to manage school systems. Recurrent expenditures need to cover costs other than teacher salaries (e.g. materials, administration).

Equity

- Equity of preschool, primary and lower secondary education supported by inclusive measures for marginalized children.

Assumptions

Aside from the access, quality and equity targets incorporated in the model, the following additional assumptions were considered:

1. Targets will be reached by 2030.

2. Population trends are as forecast by the World Bank.

3. Teachers' salaries will evolve – it is assumed that in each country, as GDP per capita grows, the PTR will approach the international trend line by the target year and the teachers' salaries will approach the "better half" international trend line by the same year. This is to ensure that salaries are sufficient to attract qualified teachers. Salaries for teachers in lower-secondary are assumed to be 50% higher than those of primary teachers, and upper-secondary teachers 20% higher again. In primary schools, teachers' salaries average 4.1 times the GDP per capita in 2030 in the base scenario, with a range of 2.1 to 8.0.

4. Expanded mobilization of domestic resources for education – the share of budgets allocated to education will increase (at a declining rate). For countries that

EDUCATION

5

already spend 6% of their GDP or more on education, we assume that this level will be maintained. For countries that spend less (whether due to low tax revenue or low prioritization of education within the budget), tax revenue and the budget share are assumed to increase at a decreasing rate (up to a maximum of 35% and 20%, respectively). The average tax growth rate for this group of countries has been 0.44 per annum in the past. Within the education budget, the share of pre-primary, primary and lower secondary education is assumed to remain constant (at 62% on average).

5. Incremental (to current spending and additional domestic spending) increased domestic tax revenues as a share of GDP and budget allocations to education in excess of 20%.

6. Allocation:
   a) 14% for classroom construction. The construction of new classrooms will be based on two assumptions: there will be one classroom per teacher; and old classrooms will need to be replaced. New classroom construction is spread over ten years. The cost of each classroom is equal to a base construction cost multiplied by a durable furniture cost. A maintenance cost of 1.5% is also assumed. Evidence on the negative impact of very large class sizes is strong, so it assumes that the average class size in low- and middle-income countries will be reduced – in preschool to an average of 20 children per teacher; in primary to an average of 40; and in secondary to an average of 35.
   b) 82% for recurrent costs – three-quarters of which is for teacher salaries, the rest for high quality learning materials, teacher training, teaching support programs, special education programs, management improvement, and school management reforms. Better leveraging existing resources (teachers and classrooms) through more effective practices and reforms can improve outcomes for a relatively low cost. In low-income countries, this category of spending is projected to grow from 10% of total education costs in primary in 2015 to 30% by 2030. At secondary level, this category is projected to grow to more than one quarter of total education costs.
   c) 4% catering to the marginalized. In addition, resources will help marginalized students start and stay in school.

7. Countries: 82 low-income countries and lower-middle income countries.

8. Long-term relationships between teacher salaries and GDP per capita, and that countries will gradually converge at average salaries.

9. That long-term relationship is modelled on the 50% of countries that pay teachers better. This is to ensure that pay is sufficient to attract the best candidates to the profession.

10. GDP growth rates up to 2016 follow IMF projections and, after that, converge at a long-term average of 5%.

11. Tax ratios as a share of GDP increase (at a declining rate).

Limitations

Despite the complexity and comprehensiveness of the model, it is important to state that the assumptions of the model do not target gender equality. This is a topic that could be further developed in future models in particular, so that the "equity" assumption not only considers increasing enrollment of marginalized children, but also considers augmenting girls' enrollment and the culmination of their studies.

5 INVESTMENT ASSESSMENT

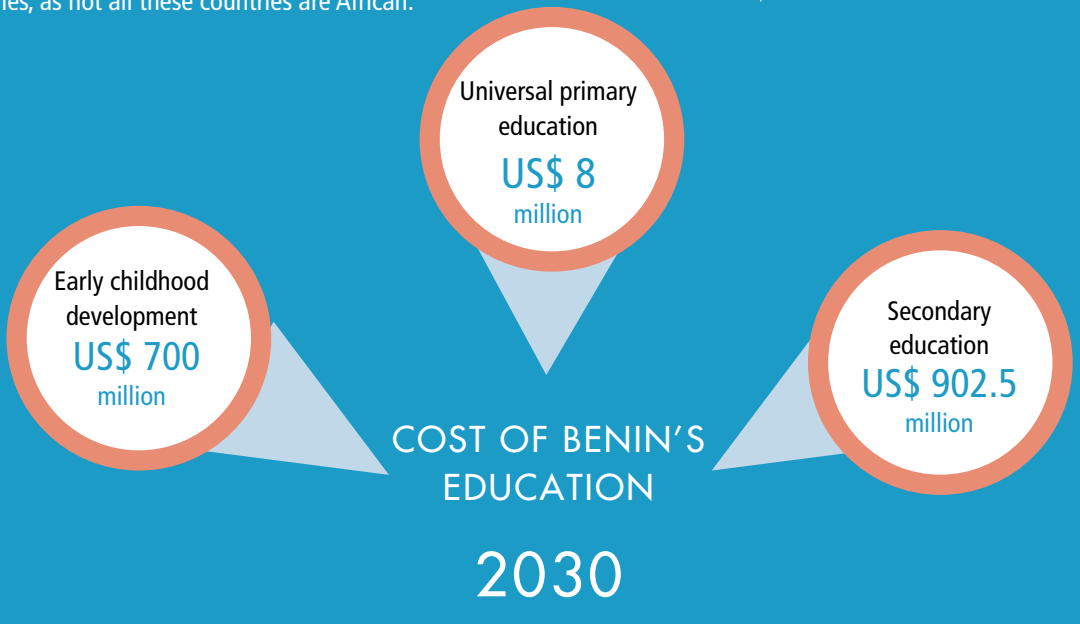
CASE STUDY BENIN

EDUCATION

The SDG Center for Africa undertook this costing work in Benin as an example of how the template can be utilized. Below are some of the preliminary results. For the purpose of this costing exercise, the SDGC/A used the per student figures that allow the country's education needs to be customized using population figures instead of analyzing the investment lump sum for low-income and middle income countries, as not all these countries are African.

For our country exercise, we estimated the "target population" per year per level of education. This is the number of children belonging to the age range associated with each education level who are not currently enrolled in their correspondent educational level. Then, based on the expenditure per student by educational level for 2012 and the projection for 2030, we estimated the annual expenditure for each year between 2015 and 2029. With the product of these two figures, expenditure per student by level per year and "target population" by level per year (those not enrolled in their correspondent education level), we obtain the total cost of achieving full enrollment for each level per year by country.

Benin, in terms of coverage, has almost achieved the target for universal primary education. It will cost US$ 8 million to achieve this target by 2030. Regarding lower secondary, achieving full coverage, raising quality and improving equity will cost US$ 902.5 million. Finally, achieving full access to quality early childhood development by 2030 will cost a total of US$ 700 million.



CASE STUDY BENIN ... continued

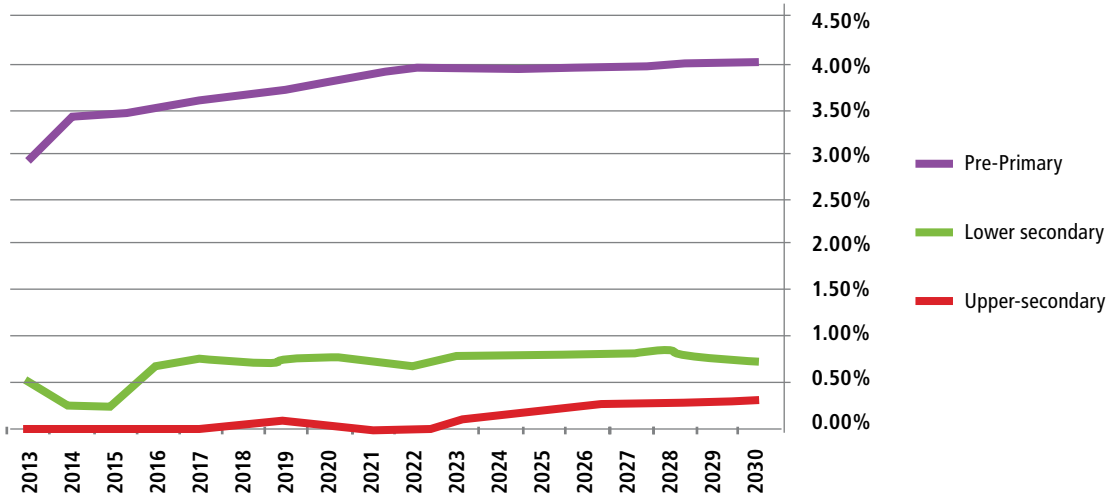
GOAL 4. ENSURE INCLUSIVE AND EQUITABLE QUALITY EDUCATION AND PROMOTE LIFELONG LEARNING OPPORTUNITIES FOR ALL

		Enrollment 2015	Enrollment Growth Needed	Enrollment Target 2030	Total Cost	Annual Cost
Target		(%)			(US$ 2012 constant prices)	
4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	Primary	99.5	0.0%	100	$7,912,176	$527,478
	Lower secondary	43.9	5.6%	100	$902,449,808	$60,163,320
	Upper secondary	-	-	-	-	-
4.2 By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education	Pre-primary	10.6	16.1%	100	$695,850,260	$46,390,017

The total investment needed in order for Benin to achieve SDG target 4.1 and 4.2 by 2030 is estimated to be US$ 1.6 billion. As of 2017, the country needs to increase its spending in education to the equivalent of 3.5% of its GDP as shown in Graph 2.

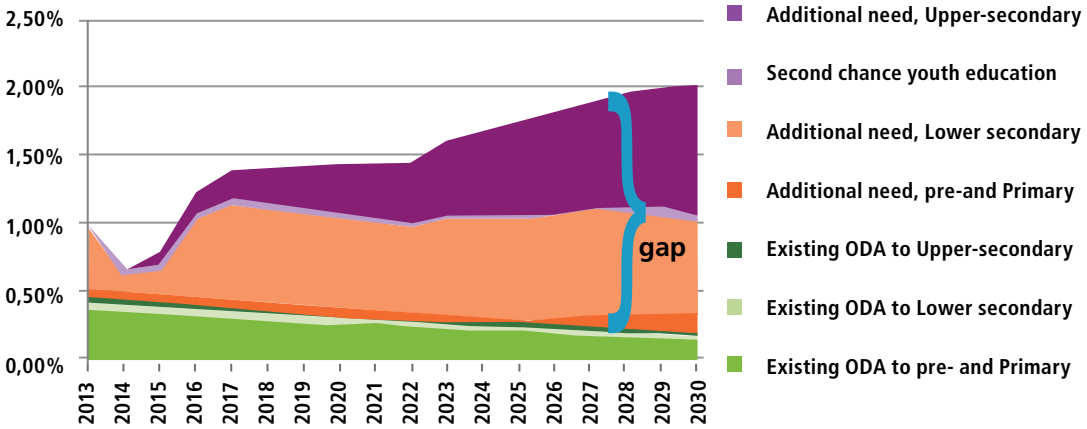
CASE STUDY BENIN ... continued

DOMESTIC RESOURCE GAPS, % OF GDP



The finance gap that remains, after increased public spending and considering that the country will grow at IMF projections, will be filled with international aid. Currently, Benin is receiving 0.45% of its GDP in ODA. If the country was to meet the education targets as discussed, this will need to be raised to 1.45% of the GDP, as show in Graph 3.

EXTERNAL FINANCE GAPS IN THE EDUCATION SYSTEM, % OF GDP



Source: Author's calculation based on the Learning Generation by the Education Commission.

HEALTH

5

II. HEALTH

Summary

Two research reports published in 2015 confirmed the importance of and need for increasing public financing of health services in order to improve countries' health status (Moreno-Serra and Smith, Smith; Reeves et al., 2015). Additionally, there are clear economic benefits to investing in health. In 2013, the Global Commission on Investing in Health declared the returns on investing in health "impressive." The Commission showed that 11% economic growth in low-income and middle-income countries resulted in reductions in mortality and returns that "exceed the cost by a factor of between 9 and 20" (Save the Children, 2015).

As a result, this tool focuses on the cost of achieving the health SDGs by building up and maintaining a healthcare system and not on aggregating the expenditures by intervention or by SDG. In spirit, the SDGs advocate for universal health coverage that ensures equal and affordable access to health benefits through the delivery of effective and efficient health services, training and developing health workers, providing drugs and supplies, managing finances, resources and equipment, and ensuring good governance and accountability. The shape and platform of this will look different in each country, as will the costs, which will depend on the population size and investment strategy.

THERE ARE FOUR ASPECTS OF THE TOOL:	
PART A.	Provide an overview of the annual investment cost of three health financing options
PART B.	Highlight the financial gap between what is currently invested and what would be needed for the targeted investment
PART C.	Break down how the health budget is allocated
PART D.	Lay out a financial strategy on how to achieve the targeted intervention by 2030

We are not advocating for one health financing scheme over another but it is important to note that some have advocated that Option C, supplemented by Option B, is the best way to promote universal access to primary care services in low-income countries.

Methodology

PART A:
Annual Investment by Health Financing Option
Three financing schemes are highlighted to provide governments with an overview of an estimated annual cost by investment option:

Option A:	**MDGs-era Health Goals**
Option B:	**Core Primary Healthcare Services**
Option C:	**>5% of GDP**

Options A & B are based on the premise that there is a minimum per capita cost to build a rudimentary healthcare system. Option C is from the school of thought that governments can invest a percentage of the GDP in health. It is understood that options A & B fall short of universal health coverage while Option C gives governments more freedom to invest in building up a comprehensive healthcare system. Once a government decides which investment scheme is most appropriate for the government, the features of the template will be adjusted according to whichever investment option was selected.

The total annual cost for Options A & B is calculated by multiplying the per capita cost with the population number. The total annual cost for Option C is calculated by first taking 5% of a country's GDP, and then dividing that amount by the population number.

5 INVESTMENT ASSESSMENT

PART A:

Description of Health Financing Options

Option A: MDGs-era Health Goals

The High Level Taskforce on Innovative International Financing for Health Systems (HLTF) estimated that low-income countries would need an average of US$ 60 per capita annually to cover a minimum set of core health services and interventions focusing largely on health related Millennium Development Goals 1, 4, 5, 6, and 8e. These would include limited care and interventions targeting and preventing non-communicable diseases; reducing mortality among mothers, newborns and children under 5; childbirth care; reproductive health services; prevention and treatment of the main infectious diseases, AIDS, tuberculosis, and malaria; diagnosis, information, referral, and relief of symptoms for those presenting at the primary care level; and health promotion. US$ 60 per capita also included the cost of capital expenditures, health workforce, drugs and supplies.

Option B: Core Primary Healthcare Services

The HLTF US$ 60 per capita figure has been updated to US$ 86 per capita to account for inflation and exchange rates as well as additional services. This figure is accepted as the amount necessary to provide core primary healthcare services in low-income countries. In addition to general care and health focuses from the MDG era, this per capita figure expands coverage to include services related to chronic diseases, cancer, neglected tropical diseases, and mental health.

Universal Health Coverage

At the heart of the health SDGs is achieving universal health coverage (UHC). This entails moving away from developing independent health systems and structures that address health issues in isolation to a more integrated, comprehensive, affordable and accessible primary healthcare system for everyone. Such a system should address a multitude of health issues and should provide preventive, promotive, curative, rehabilitative and palliative services while also strengthening and broadening human resources, drug procurement and distribution, medical supplies, information systems, financing and governance.

Option C: >5% of GDP

This option takes into account a country's revenue and level of economic activity and does not divert resources from other sectors to fund the health sector. There are a number of reports that state that an investment of over 5% (around 6-7%) of GDP is optimum to achieve UHC. The current global average is 5.1% of GDP. According to the WHO Service Availability and Readiness Assessment project, a minimum of 23 core medical professionals (defined as 'physicians, non-physician clinicians, registered nurses and midwives') per 10,000 population requires around 4% of GDP. In order to reach the current global average of 44 core medical professionals per 10,000 population, it would require an investment of over 5% of GDP (WHO, 2012). Additionally, in the 2010 World Health Report, when direct payments fall to 15-20% of total health expenditures, "the incidence of financial catastrophe and impoverishment falls to negligible levels" (WHO, 2012). In order to achieve this, governments should spend about 6% of GDP on health.

Abuja Declaration – 15% of Government Budget

In 2001, the African Union countries pledged to allocate at least 15% of their annual budget to improve the health sector by 2015. Though the target deadline has expired, only a few African countries have reached the target and many more countries have made progress towards it. While governments are progressively doing more to improve health in their countries, more can still be done.

A drawback to pegging the health budget to the national budget is that it inadvertently implies that the budget for other sectors reduces, which could adversely impact health determinants. As a result, the Abuja Declaration was not included as a financing option.

PART B:

Financial Gap

Once the financing scheme has been selected, Part B calculates the gap between the actual health expenditure and the aspirational amount, in local currency. The actual health expenditure comes from publicly available national data, which is detailed in Part C. Target health expenditure is calculated in Part A. The financing gap is calculated by taking the difference between the target and the actual health expenditure.

PART C:

Health Budget Breakdown

Part C is a breakdown of the national health budget to illustrate health expenditures in greater detail. The objective is to highlight any areas that may need more or less investment.

PART D:

Investment Strategy

The last section provides a proposed investment trajectory from the baseline (2015) to 2030.

The baseline is generated by taking the actual health expenditure from Part B and dividing it by the relevant year's population. This uses the projected population of the last year of the three periods (2020, 2025 and 2030) (sourced from the national government when available and calculated using the World Bank's population growth rate for a country when not).

In order for a government to reach its target health expenditure, a staggered investment approach is the most feasible and realistic and least daunting, though governments are encouraged to employ whatever strategy is best for them. Since the SDGs have a life span of 15 years, the duration is divided into three periods – 2016-2020, 2021-2025, and 2026-2030 – with incremental increases of 30%, 40%, 30%, respectively. With many countries still in the prioritization and planning stage in the first year and a half of the SDGs, it is unlikely that investments will increase evenly over the span of each period.

The objective is to reach the target investment by the end of each period in order to stay on track to achieve the desired health expenditure by 2030. The target investment amount is represented in a per capita figure. The total annual investment for each option is found in Part A.

For Options A & B, since the final per capita targets are fixed at US$ 60 and US$ 86, respectively, calculating the target amounts for each period is more straightforward. It assumes that the government will spend fixed per capita amounts on each individual.

The per capita calculation for Option C is different to that for Options A & B since it is based on a percentage of the GDP. The target per capita investment per period is calculated by first using the World Bank's growth rate to forecast the 2030 GDP in USD for each country. This projected GDP is then divided by the projected population for 2030 to obtain the target per capita investment figure.

Assumptions

1. The financing targets mentioned above are not ends in themselves. Government actions are needed.

2. This tool is based on the assumption that governments are employing 'maximum available resources' to build and maintain a healthcare delivery system and use those resources to efficiently provide essential health services to all their citizens.

3. The figures generated from this tool are approximations. The cost can be offset by positive externalities from other sectors.

4. A key aspect of UHC is financial protection from the costs of healthcare, and access to and use of needed

health services. However, this model does not take into account out-of-pocket payments. A research report published in 2003 demonstrated a strong correlation between government health spending as a percentage of the GDP and out-of-pocket payments as a percentage of total health spending. Specially, it found that "a 1% increase in the proportion of total health expenditure provided by out-of-pocket payments is associated with an average increase in the proportion of households facing catastrophic payments of 2.2%". In other words, the report found that the greater the level of government health spending as a percentage of GDP, the lower the share of out-of-pocket payments in the total health spending (Xu et al. (2003).

5. Health Financing Option A has expired. Although the MDGs have expired, it is technically still an option for governments to implement should they choose to.

6. The projected GDP is calculated by using the World Bank's growth rate.

7. Exchange Rates.
   a. Health Financing Option C is related to a percentage of the national budget. As a result, the monetary values are in local currency.
   b. Forecasted Rates are not available. As a result, for periods 2016-2020, 2021-2025, and 2026-2030, the average exchange for 2017 was used (830 Rwandan Francs to 1 USD).

Limitations

1. Even with maximum available resources, governments do not have enough domestic resources to fully finance an absolute target (either $60 or $86 per capita) and will need external monetary support. The United Nations acknowledged in 2015 at the Addis Ababa Agenda on Financing for Development that "significant additional domestic public resources, supplemented by international assistance as appropriate, will be critical to realizing sustainable development and achieving the sustainable development goals" (United Nations (UN), 2015: para 22). Although there has been evidence that more international funding has substituted and displaced domestic government health spending, we are advocating that international funds are truly additions to a country's domestic funds for health.

2. Employing an absolute per capita target scheme has limitations. Most notably, with a fixed monetary amount, this often translates into a fixed amount of health services. This does not always translate into UHC. Additionally, the package of services looks different in different countries because of wages and other input prices.

3. Employing a relative target tied to the budget may not pressure governments to mobilize 'maximum available resources' for the health sector.

4. Current data are not readily and publicly available. It is ideal to have all necessary data for any given year but they are not available.
   a. Population data. It is often the case for population data collected by national governments, when available, to not match the population data collected by an international agency. Additionally, population data collected by an international agency is not always updated as the most current data available from the World Bank is from 2015. In the case where a country does not produce population projections, they will have to be calculated using the population growth rate from the World Bank.
   b. Financial information. As national budgets in African governments are not always made public, a breakdown of each ministry's budget and expenditures in neat categories is even harder to come by.

5. It is not possible to have the same breakdown of national health budgets for every country. Each country breaks down their health budget and expenditure in different ways so the tool must accommodate each country's breakdown format. Similarly, the methodology and definitions used to create the budget are developed by each country. It cannot be assumed that each country has the same definition for grouping infrastructure costs, for example.

CASE STUDY RWANDA

Financial Costing to Achieve Health related SDGs

based on the average exchange rate in 2017

Country	Rwanda
Population (2015)	11,609,666

A. Total Annual Cost Financing Options*

Health SDG Financing Options		Spending Per Capita (USD)	Total Cost per Year (USD)	Total Cost per Year (Rwandan franc)
Option A	MDGs-era Health Goals	60	696,579,960	578,593,246,375
Option B	Core Primary Healthcare Services	86	998,431,276	829,316,986,471
Option C	>5% of GDP	35	404,799,001	287,979,979,874

*Based on 2015 population and budget numbers

Part A of the tool provides an overview of the total annual cost for each option. As previously mentioned, World Bank 2015 population data was used. The Ministry of Health (MoH) released population data from 2013 and has also projected population numbers to 2032. Between the two datasets, there is a difference of 347,101 people for 2015. The World Bank population data is used for the baseline, while the MoH's population projections are used in Part D of the tool.

The total annual cost for Options A & B was calculated by multiplying the per capita cost with the 2015 population number. The total annual cost for Option C is calculated by first taking 5% of Rwanda's GDP (which was 336,234,145,950 Rwandan Francs in 2015), and then dividing that amount by the 2015 population number.

B. Financial Implications of Targeted Financing Option

Targeted Financing Option:	Option B	Core Primary Healthcare Services

	Amount (Rwandan franc)	Amount (USD)
Current Health Expenditure (FY 14/15)	360,084,541,216	506,152,763
Targeted Health Expenditure	829,316,986,471	1,165,729,255
Amount Needed Annually to Achieve Target	469,232,445,255	659,576,492

An exchange rate of 711 Rwandan francs to 1 USD was used. This is the average exchange rate for 2015. Once the financing scheme has been selected, Part B calculates the gap between what is being spent and the desired amount. As seen in table B, if Option B – $86 USD per capita – is selected, there is a funding gap of 469,232,445,255 Rwandan Francs for the year 2015.

C. Breakdown of National Health Budget

	Amount (Rwandan franc)	%
National Health Budget (FY 14/15)	**360,084,541,216**	
Remuneration	108,025,362,365	30%
Drugs and health related consumables	64,815,217,419	18%
Running Costs	36,008,454,122	10%
Materials and Equipment	28,806,763,297	8%
Infrastructure	28,806,763,297	8%
Transfers	28,806,763,297	8%
Capacity Building	18,004,227,061	5%
Miscellaneous	14,403,381,649	4%
Social Benefits	10,802,536,236	3%
Transport & Travel	10,802,536,236	3%
Public Relations and Awareness	7,201,690,824	2%
Survey & Research	3,600,845,412	1%
Indirect Cost	0	0%

The national budget was available online at the Collaborative Africa Budget Reform Initiative (CABRI) website (cabri-sbo.org). However, it is not easy to neatly categorize health expenditures into remuneration, infrastructure, equipment and materials, capacity building, pharmaceutical procurements, etc. Fortunately, a report entitled Rwanda Health Resource Tracking Output was available, which provided expenditure for 2013/14 and the budget for 2014/15. Published in September 2016 by the MoH, this was used to illustrate a breakdown of the health budget for the 2014-15 fiscal year.

CASE STUDY RWANDA ... continued

D. Investment Strategy to Achieve Targeted Health Expenditure by 2030

	Baseline (2015)
Population	11,609,666
Health Budget (per capita), Rwandan franc	31,016
Health Expenditure (per capita), USD	44

	2016 - 2020	2021 - 2025	2026 - 2030
Projected Population	12,663,117	14,160,550	15,712,647
Target Percentage Increase	30%	40%	30%
Target Investment (per capita), Rwandan franc	43,125	59,271	71,380
Target Investment (per capita), USD	56	73	86

In the case of Option B, the tool illustrates that there is an investment gap of US$ 42 or 34,860 Rwandan francs, using an exchange rate of 830 Rwanda francs to 1 USD. In order for Rwanda to reach the US$ 86 per capita goal by 2030, investments must increase by US$ 12.6 (30%) by 2020, US$ 16.8 (40%) by 2025 and US$ 12.6 (30%) by 2030.

D. Investment Strategy to Achieve Targeted Health Expenditure by 2030

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Population	11,609,666
Health Budget (per capita), Rwandan franc	31,016
Health Expenditure (per capita), USD	44

	2016 - 2020	2021 - 2025	2026 - 2030
Projected Population	12,663,117	14,160,550	15,712,647
Target Percentage Increase	30%	40%	30%
Target Investment (per capita), Rwandan franc	36,869	44,672	50,525
Target Investment (per capita), USD	49	56	61

However, if Option C were selected (see above), the projected population and GDP for 2030 is used. According to the MoH, the projected population in 2030 is 15,712,647. Additionally, according to the World Bank, the projected GDP in 2030 is US$ 956,486,475 or 793,883,774,250 Rwandan francs, using an exchange rate of 830 Rwanda francs to US$ 1. The target per capita is US$ 61 or 50,525 Rwanda francs by 2030. This means that there is an investment gap of 14,110 Rwanda francs or US$ 17. In order to close this gap, investments must increase by US$ 5.1 (30%) by 2020, US$ 6.8 (40%) by 2025, and US$ 5.1 (30%) by 2030.

5 INVESTMENT ASSESSMENT

I. ELECTRICITY

Summary

The purpose of this exercise is to provide countries with a tool for determining what is required for spending on energy infrastructure to meet SDG Target 7.1 with regards to electricity access (Indicator 7.1.1). Costs for different electrification options are examined on an average household basis and then scaled up to the number of households that require access before 2030.

For this exercise, the population was divided between urban and rural due to the large difference in cost between connecting a household in an urban area versus a rural one.

Three packages were considered because it is acknowledged that it will be difficult for all countries to meet the SDG target by grid extension alone by 2030. Package 1 is 100% grid coverage. Package 2 is 90% grid coverage and 10% small solar home systems. Package 3 is 75% grid coverage, 15% small solar home systems, and 10% large solar home systems or mini-grid connections. These package choices are somewhat arbitrary and intended to show countries the cost differences in choosing an electrification path. For future work, it is envisaged that countries will adjust these percentages based on their goals and resources.

The other key indicator for energy access is access to clean fuels for cooking. This was not considered as part of this exercise because there is not a lot of overlap between between the indicators and a separate analysis is necessary. This analysis will be undertaken in due course.

Methodology

The basic procedure that was followed was to determine the number of households that will need to be electrified and then multiply that by a cost per connection. The households were broken down into urban and rural because rural connections are generally much more expensive than urban ones due to longer wiring lengths per connection. Once an overall number of connections was determined, this was spread out over the 15 year SDG period. It was assumed that an equal amount of work is carried out each year, but this is purely demonstrative and to give countries a general idea of yearly financing needs. As the years stretch out into the future, there becomes more uncertainty in terms of unit costs.

The total number of rural and urban connections was calculated by using the current total population, urban percentage of the population, urbanization rate, and population growth rate. Using these values, yearly numbers for both urban and rural populations were calculated. Household size was then used to determine the number of expected urban and rural households for each year. The total number of houses that need to electrify was taken as the total number of expected households in 2030 minus the number of currently connected households. Currently connected households in rural areas were calculated by using the rural electrification rate and the previously found number of rural households in a given year. The overall number of households connected was then calculated using the total population/household size and overall electrification rate, while the urban number of households connected was found by subtracting the rural number of households connected from the overall number of households connected.

Once currently connected numbers of households and expected numbers of households in 2030 were calculated, it was possible to find the total number of expected connections needed during the SDG period (total need – currently connected). This was then divided by 15 years to find the required number of rural and urban households to connect yearly to meet the SDG target.

The yearly number of connections was then multiplied by the cost per connection for the type of connection.

INFRASTRUCTURE – ELECTRICITY

5

Country Inputs

In order to use this template, a country must input basic population data (population, population growth rate, urban percent of the population, and urbanization rate), and current electrification data and plans (overall electrification rate, rural electrification rate, national electrification rate goal, and current spending per year on electrification). This data is, on the whole, publically available online so it should be very quick for countries to input it.

In addition, cost assumptions made using averages seen across the continent are used as initial starting points. These are used as indicative quantities, but if a country wants more accurate results, they can input their own data to replace the assumptions. Items such as cost per connection (for rural and urban) should be well known to Ministries of Infrastructure/Energy so analysis should be simple. The cost assumptions and their sources are explained in the next section.

Assumptions

Urbanization and population growth rates are constant during the period considered.

Costs are all in current dollars and do not take into account inflation. Since this analysis is for demonstration purposes to create a general plan today for the whole SDG period, it was decided to use today's USD value. Due to inflation, the actual costs will be higher than this analysis. A future task could be to calculate the amount needed in future dollars by year (assuming an inflation rate).

As previously stated, grid connections are added at a linear rate with an even amount added for each year of the SDG period. This was done for simplicity because the goal of the template is to provide general estimates for what is needed to meet the target.

For Packages 2 and 3, it was assumed that the off-grid solutions would be implemented more quickly than those on the grid. This is because these solutions can be deployed much more quickly and at lower cost (albeit with a lower level of service). If a country wanted a relatively "quick win" it would be wise to consider off-grid solutions to provide electricity access more quickly. It was assumed that small solar home systems would be deployed over the first five years, and large solar home systems or mini-grids over the first 10 years.

It was assumed that the off-grid solutions would be happening exclusively amongst the rural population.

Cost Assumptions

Costs were derived from a couple of different sources. Per customer connection costs were primarily taken from Brighter Africa by McKinsey and Co., which described a cost model where power assets are generally 60% generation, 30% distribution, and 10% transmission. Using known costs for distribution (per connection), it is then possible to calculate the total expected capital cost per connection. For urban connections, a value of $750 was used per connection for distribution, based on an average of values from Tanzania, South Africa, and Vietnam.

For rural connections, a value of $2,300 was used per connection. This is in line with Tanzania's experience and is seen as appropriate for many African countries with sparsely populated rural areas. Transmission was calculated as 10% of the expected total based on the distribution cost (as was done for urban). However, if the generation cost were calculated using 60% of the total cost for rural connections it would result in a much larger value. Considering rural users are expected to use less energy than their urban counterparts, this does not seem realistic. For this reason, the same value for generation was used in both urban and rural settings. This should account for some losses in higher transmission and distribution costs, while assuming

5 INVESTMENT ASSESSMENT

somewhat lower usage in the rural population. In addition, the initial assumption about ratios between generation, transmission, and distribution is based on countries where a considerably higher percentage of the population live in urban areas, which would make the model more valid for our urban populations.

Off-grid options are classified based on Sustainable Energy 4 All's multi-tier framework, Tiers for access. This standard is used across many countries and is understood by many working in the industry. Tier 1 and Tier 3 were considered appropriate for off-grid options because Tier 1 will provide basic light, while Tier 3 will provide enough electricity to pursue productive activities to encourage economic growth.

A Tier 1 solar home system was assumed to cost $100 based on the author's experience. This system would include three lights, a phone charger, and a radio. The components for this would cost about $50, with another $50 assumed for transport and overheads. This doesn't include financing costs for systems purchased through a PAYG method. In this analysis, it is assumed that the government will pay this cost, but given that in many countries private companies have sold hundreds of thousands of systems, it is likely that many customers could afford to purchase them privately if proper policies were in place. It was also assumed that there are currently no systems installed, which is likely untrue for some countries. However, it is difficult to find reliable information on total off-grid solar systems installed in a country, and it is an easy adjustment for a country to do when they perform a more thorough analysis.

A Tier 3 solar home system or mini-grid was assumed to cost $500, and its size will allow more productive usage of the electricity, such as refrigeration, milling, or battery charging. It could be used for TVs, stereos, barbershops, or in computing. This is also based on the author's experience and can also be applied to mini-grids if a country wishes to include these in their development plans. This system is assumed to have 300Wp of solar with the major cost components being the batteries and solar panels. This assumed price does not include a finance cost for customers.

The cost to add 1 MW to the grid was calculated using the average cost of natural gas, coal, and hydropower. The figure varies widely based on local circumstances and sources used, but $3 million is seen as a reasonable average that can then be adjusted by electrical planners.

Limitations

1. In this version, percentages for various options are set and countries cannot adjust them to their needs. This option will be explored in a future version if the need is expressed.

2. Dividing urban and rural populations is a convenient way to determine costs, but there will be a wider range of actual costs depending on population density and population clustering. Taking these into consideration would be a more complicated exercise and will be explored in the next version.

3. Cost assumptions are general and might not be indicative of country realities. For this reason, they can easily be changed by countries.

4. As mentioned in assumptions, population growth and urbanization rates are assumed to be constant. There will likely be some variation in them, but for the sake of simplicity this was not considered.

INFRASTRUCTURE – ELECTRICITY

CASE STUDY UGANDA

To demonstrate how this tool can be used, Uganda is used as an example.

1. A COUNTRY INPUTS BASIC INFORMATION ABOUT DEMOGRAPHICS AND ELECTRICITY ACCESS.

Country Inputs	Values
Starting Electrification Rate (%)	20%
Electrification Rate Goal	100%
Population	38,000,000
Population Growth Rate	3%
Percent of Population that is Urban	16%
Urbanization Rate	5.4%
Rural electricity access rate	10%
Current Spending on Electrification ($)	$500,000,000
People per household	5

On the same sheet, a user can verify and adjust assumptions in this table:

Assumptions/Adjustments	Values
Urban Grid Connection Cost	$2,500
Rural Grid Connection Cost	$4,567
Tier 1 Solar Home System Cost	$100
Tier 3 Solar Home System/ Mini-grid Cost	$500
Capital Cost to Add 1 MW of Capacity to the Grid	$3,000,000

2. THE USER CAN THEN EXPLORE THE COSTS AND OUTPUTS OF THE THREE OPTIONS PREVIOUSLY DISCUSSED. PACKAGE ONE IS SHOWN BELOW FOR DEMONSTRATION.

GOAL 7. ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

100% Grid Coverage			Current Percent of Population with Electricity Access	Stated Country Goal for Electricity Access by 2030 (or before) (%)
Target	Indicator	Goal		
9.1 By 2030, ensure universal access to affordable, reliable and modern energy services	9.1.1 Proportion of population with access to electricity	To reach 100% of the population with the grid	20%	100%

Approximate Needs to Meet Goal			Cost to meet goal ($)			
Generation Capacity (MW)	Urban Connections	Rural Connections	Urban	Rural	Total	Annual
4,988	3,214,760	6,760,922	$8,036,895,000	$30,874,875,000	$38,911,770.000	$2,594,118,000

Spending gap based on current spending ($)	
Total	**Annual**
$ 28,122,488,206	$ 1,874,832,547

This sheet provides all needed outputs for the chosen package. Uganda needs approximately 5.0 GW of added capacity, about 3.2 million additional urban connections, and 6.7 million rural connections. Total cost is then found by multiplying the needs by the unit costs. All of this is based on the unit costs described before, population, population growth rates, and urban/rural statistics. A spending gap analysis is also shown based on the current spending on electricity access by the country (for this example, this was estimated for Uganda and is not a representation of true spending).

INFRASTRUCTURE – ELECTRICITY

3. ALL NEEDED RESULTS ARE SHOWN ON ONE SHEET, BUT CALCULATIONS ARE MADE ON ANOTHER SHEET, SHOULD THE USER WANT TO DIG DEEPER INTO THE NUMBERS.

	2016	2017	2018	2019
Population	38,000,000	39,140,000	40,314,200	41,523,626
Urban Population	6,232,000	6,785,000	7,387,000	8,043,000
Rural Population	31,768,000	32,355,000	32,927,200	33,480,626
Starting Number of HH Connected (5 ppl/ HH)	1,520,000	2,185,045	2,850,091	3,515,136
Urban HH Connected Beginning of Year	884,640	1,098,957	1,313,275	1,527,592
Rural HH Connected Beginning of Year	635,360	1,086,088	1,536,816	1,987,544
Urban HH Connected This Year	214,317	214,317	214,317	214,317
Rural HH Connected This Year	450,728	450,728	450,728	450,728
Households Connected	665,045	665,045	665,045	665,045
Urban HH Connected at End of Year	1,098,957	1,313,275	1,527,592	1,741,909
Rural HH Connected at End of Year	1,086,088	1,536,816	1,987,544	2,438,273
HH Connected at end of year	2,185,045	2,850,091	3,515,136	4,180,182
Urban Access at End of Year %	88%	97%	103%	108%
Rural Access at End of Year %	17%	24%	30%	36%
Overall Access at End of Year %	29%	36%	44%	50%
Urban Yearly Cost (2016 $)	$535,793,000	$535,793,000	$535,793,000	$535,793,000
Rural Yearly Cost (2016 $)	$2,058,325,000	$2,058,325,000	$2,058,325,000	$2,058,325,000
Overall Yearly Cost (2016 $)	$2,594,118,000	$2,594,118,000	$2,594,118,000	$2,594,118,000
Current Spending (Increase 5% yearly - 2016 $)	$500,000,000	$525,000,000	$551,250,000	$578,812,500
Yearly Gap (2016 $)	$2,094,118,000	$2,069,118,000	$2,042,868.000	$2,015,305,500

5 INVESTMENT ASSESSMENT

II. ROADS

Summary

The purpose of this exercise is to provide countries with an estimate of what is required for spending on road construction to achieve universal access to roads (defined as an all-season road within 2 km of every household, as per SDG target 9.1.1). This is done by determining a required road density for a given country. This is calculated by using countries that have already achieved access targets to determine the needs for a country striving to meet the SDG target.

The amount and type of roads required to do this will obviously vary vastly among countries. However, there is a relationship between population density and road density, and it is possible to determine this relationship by coming up with a model that uses data from countries that have already achieved access targets. We compiled rural access data from most countries in the world, and then we looked at countries that had achieved universal access. Upon examining this data, it was clear that a linear relationship existed between population density and road density for these countries. A simple linear regression was then completed, and then coefficients were used to determine the road density needs by inputting the population density. In other words, at a given population density this relationship predicts a required road density. This road density is then used to estimate the cost of meeting the SDG target.

A second similar analysis was then done to achieve approximately 75% access by looking at countries that had achieved an access rate close to this.

To assign costs, the ROCKS dataset from The World Bank was used, based on average values for three chosen categories of roads (expressways, paved (non-expressway), and unpaved).

Methodology

As previously stated, a simple linear regression was completed to determine the relationship between population density and road density for selected countries within a certain range of the Rural Access Index (RAI). It was completed for two scenarios – one where a country aims to reach an RAI similar to many middle-income countries (75%) and one where a country aims to reach near universal access (>90% RAI). For the latter scenario, it was determined that above 90% RAI could be considered universal access because this is the level that most highly developed countries have reached. There are many local reasons why 100% RAI is nearly impossibly or extremely expensive, so reaching a level on par with developed nations is sufficient to meet the target. This also provided a large enough group to do a linear regression analysis.

This linear regression analysis was completed in R, a software program for statistical computing, and the results were exported into Excel.

Once the linear regression was completed, it was possible to determine the required road density by using the population density of a country. These values were calculated in Excel. After this, road costs per kilometer and percentages of different types of roads were used to determine a final cost to meet the target. These calculations are described in more detail below.

All data and code used to conduct this analysis is freely and publicly available on the SDGC/A website. The hope is that this tool will be used by country planners, so they are encouraged to use the template and adjust it to their local needs.

Exclusions

Extremely small countries (>5000 km^2) were excluded from this analysis because they were generally seen as outliers. In addition, Finland was excluded as an extreme outlier due to its low population density but very high road density.

Greater than 90% RAI

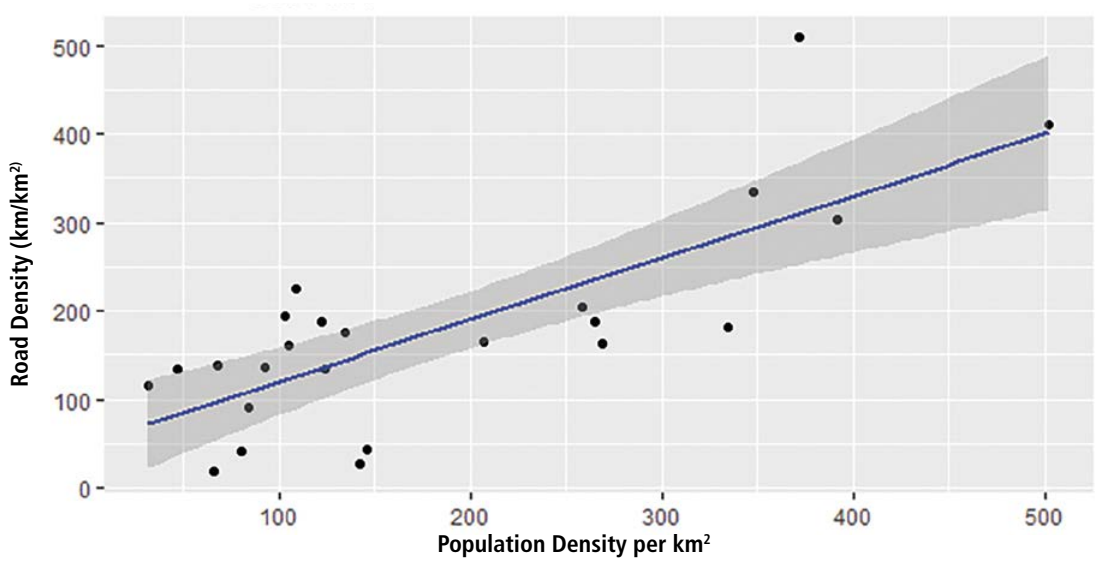
There are 24 countries that met this qualification. They are listed below in the table.

Austria	Belgium	Bulgaria	China
Denmark	France	Greece	Hungary
Indonesia	Ireland	Italy	Jamaica
Japan	Latvia	Lithuania	Netherlands
Poland	Puerto Rico*	Slovenia	Spain
Sri Lanka	Timor-Leste	Trinidad and Tobago	United Kingdom

*Puerto Rico is a territory of the United States, but it is considered independently for this analysis because it is physically separated from the continental U.S.

The scatter plot of population density vs. road density follows a linear regression curve, shown below (including a margin of error).

POPULATION DENSITY VS ROAD DENSITY FOR COUNTRIES ABOVE 90% RAI



Data source: Authors calculation, World Bank.

5 INVESTMENT ASSESSMENT

From this analysis, it was shown that there was a strong positive liner relationship between the two variables with an R2 value of 0.595. The coefficients of the regression are:

Intercept	50.5418
Slope	0.6984

This means that for every unit of increase in the population density, the road density should increase by 0.684.

75% RAI

This calculation included countries that were between 65 and 85% RAI. This provided a large enough sample size to calculate a good linear regression, and the correlation between the two was quite strong so we believe it is a valid interval. In other words, in this range there still seems to be a strong relationship between population density and road density, so it's safe to group them together. The interval was also chosen to center around 75%. It should be noted that by using this larger interval, it is difficult to predict precisely what RAI will be produced by the prescribed road density determined by the population density. However, it is possible to say that the RAI for a group of tested countries will average out to be 75% RAI. The main purpose of this calculation is for countries to reach a level similar to many middle-income countries, and this range of RAI will achieve that.

The following countries (46) are included in the sample:				
Argentina	Armenia	Azerbaijan	The Bahamas	Belize
Bosnia and Herzegovina	Botswana	Cambodia	Chile	Colombia
Costa Rica	Croatia	Cuba	Djibouti	Ecuador
Fiji	The Gambia	Georgia	Iceland	Jordan
Kazakhstan	Kuwait	Lesotho	Liberia	Libya
Malaysia	Moldova	New Zealand	Norway	Oman
Panama	Papua New Guinea	Philippines	Qatar	Saudi Arabia
Sierra Leone	Solomon Islands	Suriname	Tajikistan	Turkey
Turkmenistan	United Arab Emirates	Uruguay	Vanuatu	Vietnam
Zimbabwe				

The scatter plot of population density vs. road density follows with a linear regression curve, shown below (including a margin of error).

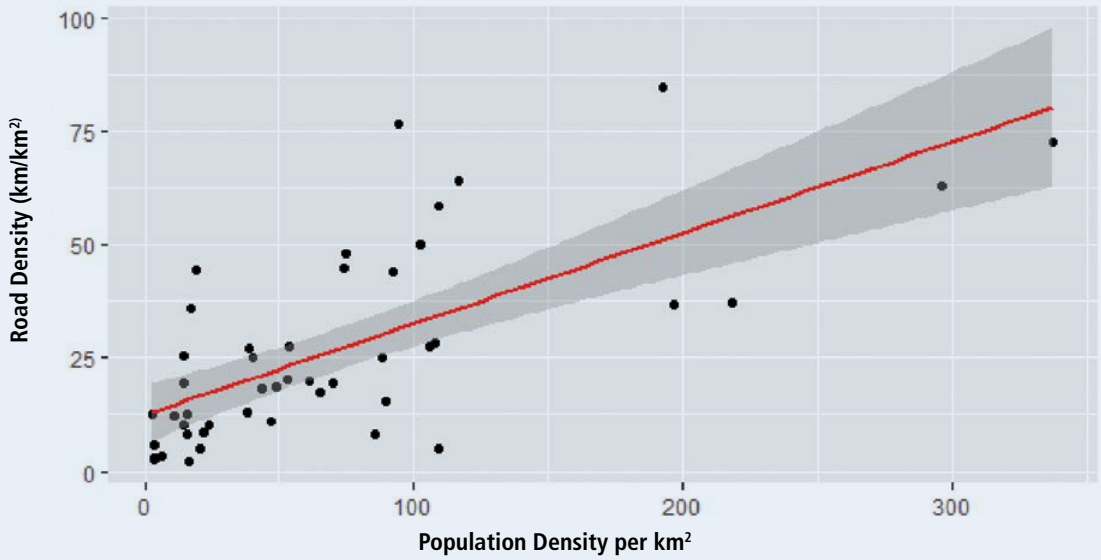
From this analysis, it was shown that there was a strong positive liner relationship between the two variables with an R2 value of 0.4808. The reason for the slightly lower R2 value is likely due to the larger RAI interval used.

The coefficients of the regression are:

Intercept	12.50567
Slope	0.20041

This means that for every unit of increase in the population density, the road density should increase by 0.20041.

POPULATION DENSITY VS ROAD DENSITY FOR COUNTRIES ABOVE 65 AND 85% RAI



Data source: Authors calculation, World Bank.

5 INVESTMENT ASSESSMENT

Breakdown by type of road

As previously stated, the ROCKS dataset was used to estimate costs per kilometer for different types of road. This seems to be the most comprehensive database of its kind, comparing costs across many different projects and countries.

Once these per kilometer costs were determined, it was necessary to identify what percentage of the roads will be expressway, paved, and unpaved. This was determined by looking at the ratios in countries with full coverage (> 90% RAI). This was used because it was seen as an estimate of what a completed road network might look like, averaged across a diverse sample set. Obviously, this ratio is just an estimate, and local conditions and studies will determine needs more accurately. The ratios determined from this method are as follows:

Road Type	Percent
Expressway	1.1%
Paved (non-expressway)	74.8%
Unpaved	24.1%

In the country inputs, countries are asked to input current spending on new roads, which will then show funding gaps for investment needed to meet the different targets.

Assumptions

Sources of data

The cost data is based on the ROCKS dataset from The World Bank. This data was collected over 10 years (1996 – 2008) and included over 300 projects, primarily financed by The World Bank all over the developing world. The purpose of this dataset was to understand average costs of various road projects to eliminate waste. This makes it a perfect dataset for the purposes of this template as it encompasses a wide variety of situations.

The CIA Factbook was used to estimate the total road distance for all countries. For most countries, this includes estimates of expressways, paved (non-expressway), and unpaved roads. It is assumed that the unpaved roads are all-season as they are mostly official roads maintained by governments. Given that the Factbook estimates are lower than some other estimates, it can reasonably be assumed that the roads specified are all-season.

The World Bank's Rural Access Index (RAI) data was used to determine initial access percentages.

Land area and population data was obtained from the World Bank's online database (data.worldbank.org).

Types of road

For this analysis, three types of roads were considered. These were a two-lane highway, a two-lane paved road, and a two lane earth road (all-weather). This mix of roads is expected to cover the needs of most countries and, if it is deemed necessary, an option for a four-lane expressway can be added. Other road options may be used, but for preliminary planning purposes, these options should be sufficient to provide a scale estimate of the cost of road infrastructure.

Costs

As previously stated, the ROCKS dataset was used for cost data. In terms of the ROCKS dataset, the following cost categories were used for the analysis. For earth roads, the chosen category was "Upgrading to Earth 2L" because it is assumed that this will then make it passable by vehicle and available year-round. This cost is also in line with other literature for the cost of all-weather roads. Ethiopia estimated $17,000 per kilometer for all weather roads in an extensive project, so this estimate from ROCKS is seen as reasonable.

Common Language Road Category	ROCKS Category	# in ROCKS Database	Cost per km
Two-lane highway	New Bituminous 2L Highway	43	$828,245
Two-lane paved road	Upgrading to Bituminous 2L	283	$276,508
Earth road	Upgrading to Earth 2L	6	$12,683

Obviously, these are averages and will simply provide an indicative cost for a country. To obtain more accurate information, country/situation specific costs should be used.

Limitations

1. The cost values are averages over a large dataset with a lot of variation. These variations will show up in countries as well, so the costs should be used as indicative instead of a replacement for due diligence on road projects.

2. The RAI that was used for this analysis was an older version; the World Bank has recently redefined the indicator to include GIS tools. This new method is likely more accurate than previous methods, and it would be ideal to use GIS analysis to provide a more accurate needs assessment. For the next version of this analysis, GIS based road and population data will be used.

3. Road length data for countries is difficult to find, and estimates for the same country tend to vary widely. The CIA Factbook was used as the source to have equivalent estimates across countries, but the accuracy of this data compared to other sources is not well known. In many countries, digital mapping is improving (OpenStreetMap or Google), which will allow future analysis to use verified roads instead of estimates.

4. Cost data was taken over a long period and may possibly be out of date, but no better data source for multiple projects worldwide could be found.

5. This study looks at the capital cost to build roads and does not consider maintenance or rehabilitation costs for these roads. Compared to the initial cost of construction, these corollary were assumed to be small enough to disregard for a scale cost estimate. They will be considered for inclusion in a future revision.

Improved Road in Bonsaaso, Ghana.

5 INVESTMENT ASSESSMENT

CASE STUDY: UGANDA

TO DEMONSTRATE HOW THIS TOOL CAN BE USED, UGANDA PROVIDES AN EXAMPLE.

1. A country inputs basic information about demographics and road access. Road length numbers can be taken from the CIA Factbook, or countries can supply their own.

Country Inputs	Values
Length of Roads	20,000
Current Paved Length (primary and secondary - two lane)	3,264
Current Earth All Season Roads	16,736
Population	38,000,000
Population Growth Rate	3%
Annual Spending on new roads ($) in 2016 (assuming growth of 5% annually for this value)	$1,000,000,000

On this same sheet, a user can verify and adjust assumptions in this table:

Assumptions/Adjustments	Values
Cost per km of paved two-lane highway ($)	$828,245
Cost per km of paved two-lane road ($)	$276,508
Cost per km of two-lane all weather road ($)	$12,683
Average cost of road ($/km)	$218,686
Land Area (km^2)	200,520

2. Following these inputs, calculations take place on other sheets, and the user can then explore the costs and outputs of the two options in greater depth.

Goal 9.	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation			
95% goal (full coverage)			Current Road Density (km/km^2)	Required Road Density in 2030 to meet goal (km/100km^2)
Target	Indicator	Goal		
9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	9.1.1 Proportion of the rural population who live within 2 km of an all-season road	To reach 95% of the rural population. This level can be considered covering the whole population and will bring up the indicator to the level of most high income countries	10	251

Length of road in 2030 to meet goal				Cost to meet goal ($)		Spending gap based on current spending ($)	
TOTAL	Express-way	Paved (non-ex-pressway)	Unpaved	Total	Annual	Total	Annual
502,776	5,361.24	376,010	121,404	$ 105,576,270,907	$ 7,038,418,060	$ 83,997,707,317	$ 5,599,847,155

INFRASTRUCTURE – ROADS

CASE STUDY: UGANDA

These results give a snapshot of the needs calculated for Uganda to achieve the Goal by 2030. The required density is calculated from the linear regression discussed previously. Lengths for each type of road are then calculated based on land area and percentages of each type of road gleaned from the ROCKS database. These lengths are then multiplied by the $/km value in the ROCKS database to identify the final cost to meet the goal. A spending gap analysis is based on current road spending by the country (in this example, this was estimated and is not a representation of true spending).

3. All needed results are shown on one sheet, but calculations are on another sheet should the user wants to dig deeper into the numbers and look at results by year.

	2016	2017	2018	2019
Population	38,000,000	39,140,000	40,314,200	41,523,626
Population Density	189,51	195,19	201,05	207,08
Starting Road Length	20,000,00	24,572,77	29,374,17	34,415,65
Actual Road Density (km/100km^2)	10	12	15	17
Road Density to achieve 75% rural access (changes with population)	50	52	53	54
Road Density to Achieve 95% access (assumed full coverage)	183	187	191	195
Current Spending Length to be added using weighted average cost (km)	4,572,77	4,801,40	5,041,48	5,293,55
km of highway added	48.8	51.2	53.8	56.4
km of paved added	3,420	3,591	3,770	3,959
km of all-weather added	1,104	1,159	1,217	1,278
Current Spending on Roads (2016 $)	$1,000,000,000	$1,050,000,000	$1,102,500,000	$1,157,625,000
Cost to achieve 75% access by 2030	$1,753,407,576	$1,753,407,576	$1,753,407,576	$1,753,407,576
Cost to achieve 95% access (full coverage) by 2030	$7,038,418,060	$7,038,418.060	$7,038,418,060	$7,038,418,060
Gap to reach 75% access	$753,407,576	$703,407,576	$650,907,576	$595,782,576
Gap to reach 95% access (full coverage)	$6,038,418,060	$5,988,418,060	$5,935,918,060	$5,880,793,060

5 INVESTMENT ASSESSMENT

IV. FINANCE

Achieving the SDGs will not only require improved policies and effective governance for Africa, but also increased public and private investments. Just as financing alone will not deliver the SDGs, neither will improved policies that are not backed by increased investments. Two central questions for achieving the SDGs are therefore how much public and private financing is needed to achieve the SDGs, and how much financing can be mobilized through domestic resources (Schmidt-Traub and Sachs, 2015a)?

The root cause of many development problems in African countries is a lack of public resources to address the problem. The ambitious targets of the SDG agenda demand accelerated development that may burden African governments' resources. It is important to recognize this as a key constraint so that public investment can be increased in accordance with capacity, and that regulatory incentives make private investment in programs attractive. The first steps in doing this are to conduct an investment needs assessment and to identify what financial sources are most appropriate to fill identified gaps.

1. INVESTMENT NEEDS ASSESSMENT

An accurate assessment of investment needs includes an estimate of the resources required to strengthen policy-making, implementation processes and other institutional capacities to achieve the SDG strategy. Paying attention to investment needs from the diagnostic stage of the planning process ensures that the SDG needs assessment is a robust, continuous process that accounts for different investment areas, in addition to extra resources needed to accelerate development.

Schmidt-Traub and Sachs's 2015 report Investment Needs to Achieve the Sustainable Development Goals in Low- and Lower-Middle-Income Countries: Understanding the Billions and Trillions emphasizes the following focal areas for estimating SDG investment needs:

- **Investment in human resources and capacity building**: Policy making and implementation depend on the capacity of governance institutions and actors. Increased investment flows must be matched by increased capacity to effectively absorb and mobilize these flows towards the right outcomes.

- **Payoffs from investments in cross-cutting areas:** Some goals and targets of the SDG agenda may have greater impact due to their cross-cutting nature. Investments in areas such as inequality, gender, and sustainable consumption and production, for example, will have an impact on a large number of related goals due to their cross-sectoral nature.

- **Ensure that climate change adaptation and mitigation needs are accounted for:** Tackling climate change will be key to achieving the SDGs. Many investments in mitigation and adaptation – such as a low-carbon energy plant or climate-resilient infrastructure – are operationally indistinguishable from investments in "development" and must be structured and executed together.

- **Consider economy-wide effects of SDG investment needs:** SDG implementation is expected to have significant spillovers into the larger socioeconomic conditions within a country. Some important changes might include supply-side effects on economic growth, shifts in the labor market, and domestic government resource mobilization.

2. SOURCES OF FINANCING

The SDG Agenda sees "public finance, both domestic and international" playing a "vital role in providing essential services and public goods (Transforming our world: the 2030 Agenda for Sustainable Development, 2015)." The diverse roles of the private sector, "ranging from micro-enterprises to cooperatives to multinationals, and that of civil

society organizations and philanthropic organizations" are recognized as key to implementation (Transforming our world: the 2030 Agenda for Sustainable Development, 2015). The following section offers recommendations on investment areas that are most appropriate for public financing and where opportunity lies for private investment and public-private partnerships.

a) Public Financing

African countries will take primary responsibility for financing development with domestic resources – including at municipal and sub-national levels – taking precedence over international aid. It is recommended that developing countries raise 20% of their GNI from their Domestic Resource Budget (DRB), which is estimated to be 17-18% of the GNI for low-income countries in Africa (Schmidt-Traub and Sachs, 2015a). The World Bank (2013) and the Intergovernmental Committee of Experts on Sustainable Development Financing (2015) provide a comprehensive summary of the steps countries can take to strengthen their DRB at the national level through raising additional revenues, cutting wasteful expenditure, and ensuring effective use of scarce resources. Given the widespread devolution of responsibilities for public expenditure and the rapid urbanization in many developing countries, DRB must also be strengthened at the sub-national level.

In general terms, public financing covers areas where private, for-profit financing is insufficient or impossible. The following thematic areas are recommended for public financing in the African region (Schmidt-Traub and Sachs, 2015a):

- Helping the poor to meet basic needs: Most social services, including healthcare, early childhood development (e.g. safe childcare and preschool), education, job training, and other "merit goods" described as "human rights" or "basic human needs."
- Networked infrastructure: Many types of network infrastructure, such as rail, roads, pipelines, power distribution, and some forms of ICT.
- Post-conflict assistance and peacebuilding: International assistance for peacekeeping, peacebuilding, post-conflict humanitarian aid, and post-conflict development.
- Climate change mitigation and adaptation: Protection against rising sea levels and increasing storm intensity, financing to respond to extreme climate events, incremental costs of low-carbon energy and other mitigation efforts.
- Biodiversity conservation and ecosystem services: Terrestrial biodiversity and ecosystems (forests, savannahs, wetlands, freshwater ecosystems) as well as marine and coastal biodiversity and ecosystems.
- Promoting innovations in sustainable technologies: Research, Development, Demonstration and Diffusion (RDD&D) of new technologies.

b) Private Investment

In many areas, business will play a direct, and indeed often dominant, role in delivery and implementation. Businesses will deliver most investments in infrastructure and can sometimes play an important role in improving social service delivery. They can leverage public financing so that scarce public resources can go further. Private companies are also major sources of R&D, early-stage technology deployment, and large-scale production systems, and often have knowledge of the best practices for technology diffusion in low-income settings. Note, though, that in some areas, such as health, education, or biodiversity protection, businesses are typically backed by public funds and public regulation. In other areas, such as infrastructure, private financing will probably account for much or most of the required financing.

5 INVESTMENT ASSESSMENT

c) Public-Private Partnerships

A central question for financing the SDGs is how incremental public and private resources can be mobilized, using private resources as substitutes for scarce public funding. Many SDG-based projects and programs will involve a mix of public, private, and social investors, and of public and private sources of financing. A continued use of Public Private Partnerships (PPP) is expected, in which the project design entails a formal partnership of the public and private sectors.

PPPs can involve national as well as sub-national governments, including local authorities, and come in a variety of forms (Schmidt-Traub and Sachs, 2015b):

- **Private provision on public contract:** A business may be the supplier on a publicly-financed contract. This can be for R&D, early-stage technology development, or the deployment of infrastructure. Many key technologies, such as the early semiconductor industry, developed on the basis of government procurement.

- **Market price corrections:** A variety of tax and subsidy corrections exist to provide incentives for business in line with social costs and benefits. Examples include tax credits for investments in new (risky) technologies, feed-in tariffs for renewable energy, carbon pricing, tobacco taxes, and investment and export guarantees or insurance.

- **Differential pricing by business:** Businesses may provide discounts or free supplies for products and services in low-income settings on a promise from governments to maintain (higher) patent-protected pricing in all other markets. An important example for differential pricing is the marketing of essential medicines in developing countries, which has made a tremendous contribution to the fight against many infectious diseases, including HIV/AIDS.

- **Global fund mechanisms:** The GFATM and Gavi are examples of public-private partnerships in the health sector with public financing that can in turn mobilize a significant share of private co-financing.

- **Technology consortia:** The public sector may sponsor a consortium of private and public entities to carry out R&D and pre-commercial trials for new technologies.

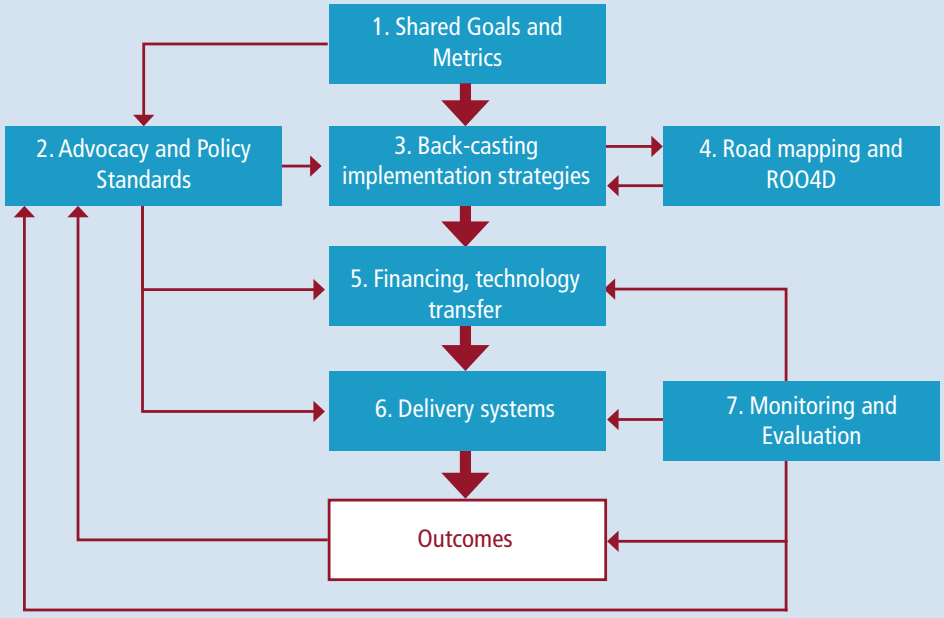
- **Market maker:** Publicly (co-) financed institutions may aggregate diffuse demand across a large number of countries and provide long-term visibility to suppliers to support the creation of markets that are financially viable, but too complex for private actors alone to establish.

Effective partnerships are not centrally planned, and they do not require one actor that oversees all activities. However, delivering results at the required scale requires a high degree of mobilization and organization. Schmidt-Traub and Sachs' (2015b) article Goal-based Investment Partnerships: Lessons for the Addis FfD Conference describes how each sector has unique features and requirements for success, so there cannot be a one-size-fits-all approach to building global public-private partnerships. The article outlines seven core processes of goal-based partnerships, illustrated in the following figure.

FINANCE

5

SEVEN CORE COMPONENTS OF GOAL-BASED INVESTMENT PARTNERSHIPS



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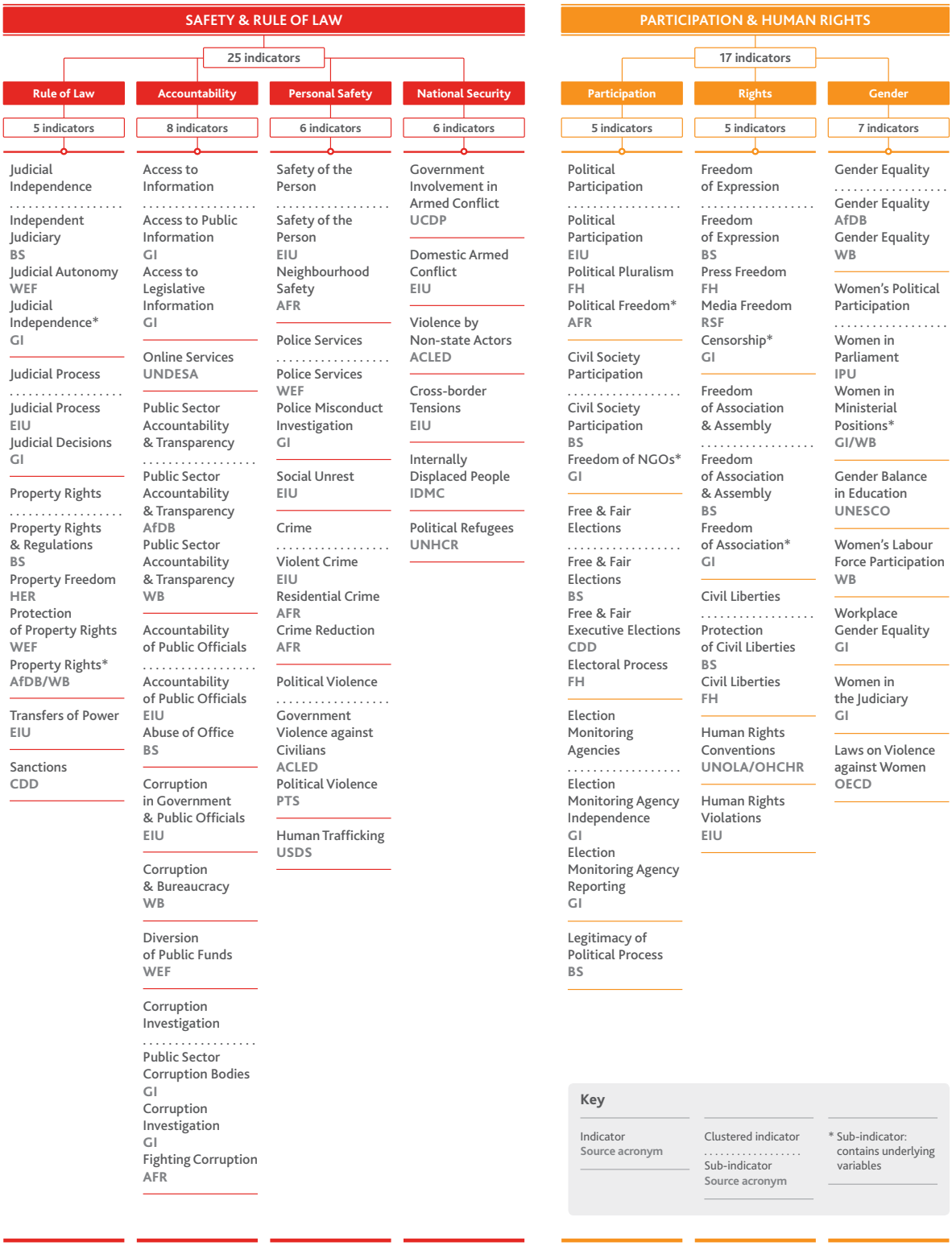
ANNEXES

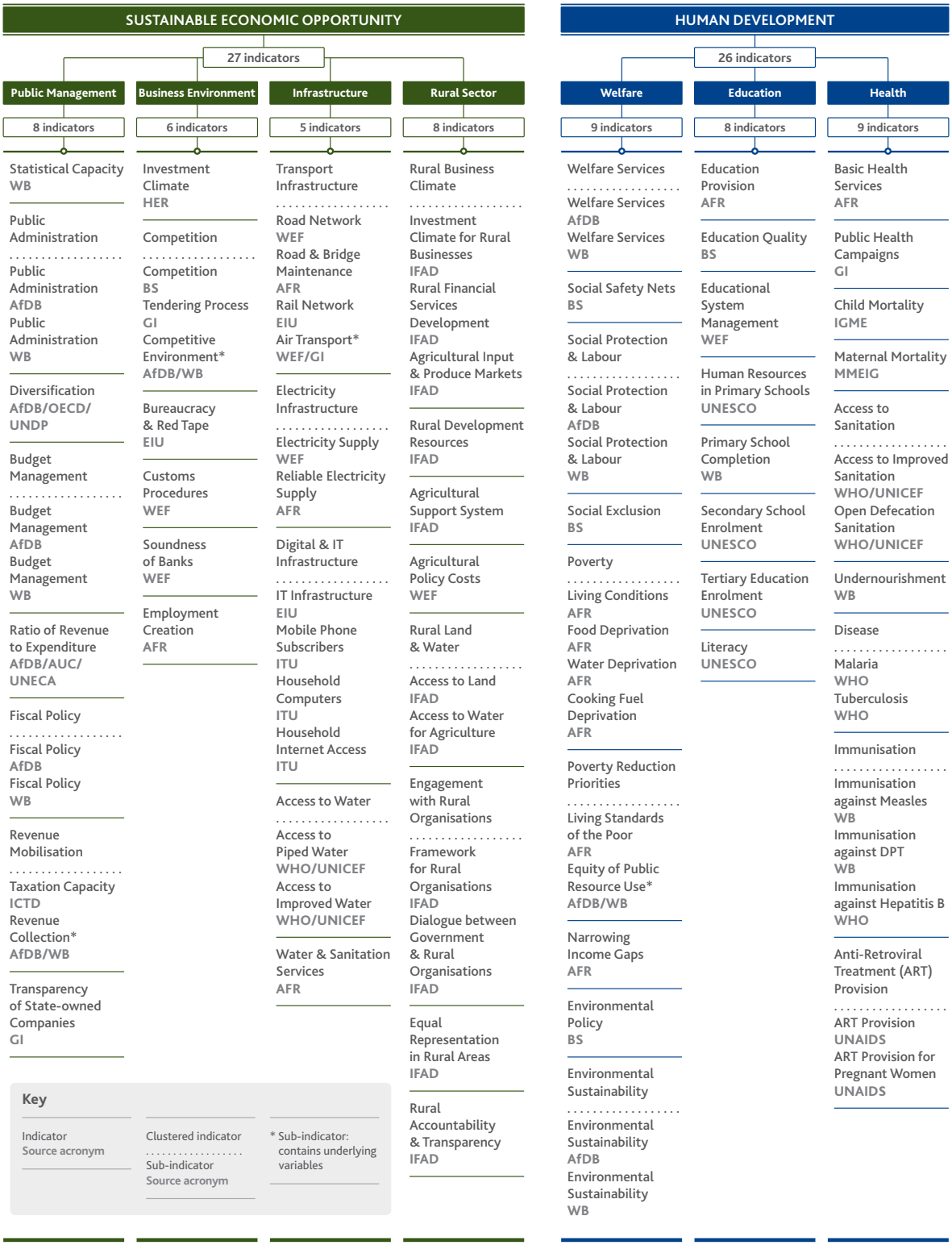
ANNEX 1

IIAG framework: *Safety & Rule of Law* and *Participation & Human Rights* in 2016



2017 IBRAHIM INDEX OF AFRICAN GOVERNANCE FRAMEWORK

IIAG framework: *Sustainable Economic Opportunity* and *Human Development* in 2016



ANNEX 2

TRANSPARENCY INTERNATIONAL 2016 CORRUPTION PERCEPTIONS INDEX: AFRICA

2016 World Rank	2016 Africa Rank	Country	2016 Score	2015 Score	2014 Score	2013 Score	2012 Score
35	1	Botswana	60	63	63	64	65
38	2	Cape Verde	59	55	57	58	60
50	3	Mauritius	54	53	54	52	57
50	4	Rwanda	54	54	49	53	53
53	5	Namibia	52	53	49	48	48
62	6	Sao Tome and Principe	46	42	42	42	42
64	7	Senegal	45	44	43	41	36
64	8	South Africa	45	44	44	42	43
70	9	Ghana	43	47	48	46	45
72	10	Burkina Faso	42	38	38	38	38
75	11	Tunisia	41	38	40	41	41
83	12	Lesotho	39	44	49	49	45
87	13	Zambia	38	38	38	38	37
90	14	Liberia	37	37	37	38	41
90	15	Morocco	37	36	39	37	37
95	16	Benin	36	37	39	36	36
101	17	Gabon	35	34	37	34	35
101	18	Niger	35	34	35	34	33
108	19	Algeria	34	36	36	36	34
108	20	Côte d'Ivoire	34	32	32	27	29
108	21	Egypt	34	36	37	32	32
108	22	Ethiopia	34	33	33	33	33
116	23	Mali	32	35	32	28	34
116	24	Tanzania	32	30	31	33	35
116	25	Togo	32	32	29	29	30
120	26	Malawi	31	31	33	37	37

TRANSPARENCY INTERNATIONAL 2016 CORRUPTION PERCEPTIONS INDEX: AFRICA

2016 World Rank	2016 Africa Rank	Country	2016 Score	2015 Score	2014 Score	2013 Score	2012 Score
123	27	Djibouti	30	34	34	36	36
123	28	Sierra Leone	30	29	31	30	31
136	29	Nigeria	28	26	27	25	27
142	30	Guinea	27	25	25	24	24
142	31	Mauritania	27	31	30	30	31
142	32	Mozambique	27	31	31	30	31
145	33	Cameroon	26	27	27	25	26
145	34	Gambia	26	28	29	28	34
145	35	Kenya	26	25	25	27	27
145	36	Madagascar	26	28	28	28	32
151	37	Uganda	25	25	26	26	29
153	38	Comoros	24	26	26	28	28
154	39	Zimbabwe	22	21	21	21	20
156	40	Democratic Republic of Congo	21	22	22	22	21
159	41	Burundi	20	21	20	21	19
159	42	Central African Republic	20	24	24	25	26
159	43	Chad	20	22	22	19	19
159	44	Republic of Congo	20	23	23	22	26
164	45	Angola	18	15	19	23	22
164	46	Eritrea	18	18	18	20	25
168	47	Guinea-Bissau	16	17	19	19	25
170	48	Libya	14	16	18	15	21
170	49	Sudan	14	12	11	11	13
175	50	South Sudan	11	15	15	14	N/A
176	51	Somalia	10	8	8	8	8

ANNEX 3

EDUCATION

GOAL 4. ENSURE INCLUSIVE AND EQUITABLE QUALITY EDUCATION AND PROMOTE LIFELONG LEARNING OPPORTUNITIES FOR ALL						
		Enrollment 2015	Enrollment Growth Needed	Enrollment Target 2030	Total Cost	Annual Cost
Target					(%)	(US$ 2012 constant prices)
4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	Primary	99.5	0.0%	100	$7,912,176	$527,478
	Lower secondary	43.9	5.6%	100	$902,449,808	$60,163,320
4.2 By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education	Pre-primary	10.6	16.1%	100	$695,850,260	$46,390,017

EXAMPLE PACKAGE 1, DIFFERENT 2030 TARGETS

	Enrollment Target by 2030 (%)	Total Cost to 2030 (US$ 2012 constant prices)
Primary	100	$ 7,912,176,05
Lower secondary	90	$ 902,449,807,76
Pre-primary	90	$ 695,850,259,84
		$ 1,606,212,243.60 (Total Cost)

HEALTH

Financial Costing to Achieve Health related SDGs

based on the average exchange rate in 2017

Country	Rwanda
Population (2015)	11,609,666

A. Total Annual Cost Financing Options*

	Health SDG Financing Options	Spending Per Capita (USD)	Total Cost per Year (USD)	Total Cost per Year (Rwandan franc)
Option A	MDGs-era Health Goals	60	696,579,960	578,593,246,375
Option B	Core Primary Healthcare Services	86	998,431,276	829,316,986,471
Option C	>5% of GDP	35	404,799,001	287,979,979,874

*Based on 2015 population and budget numbers

B. Financial Implications of Targeted Financing Option

Targeted Financing Option: Option B Core Primary Healthcare Services

	Amount (Rwandan franc)	Amount (USD)
Current Health Expenditure (FY 14/15)	360,084,541,216	506,152,763
Targeted Health Expenditure	829,316,986,471	1,165,729,255
Amount Needed Annually to Achieve Target	469,232,445,255	659,576,492

C. Breakdown of National Health Budget

	Amount (Rwandan franc)	%
National Health Budget (FY 14/15)	**360,084,541,216**	
Remuneration	108,025,362,365	30%
Drugs and health related consumables	64,815,217,419	18%
Running Costs	36,008,454,122	10%
Materials and Equipment	28,806,763,297	8%
Infrastructure	28,806,763,297	8%
Transfers	28,806,763,297	8%
Capacity Building	18,004,227,061	5%
Miscellaneous	14,403,381,649	4%
Social Benefits	10,802,536,236	3%
Transport & Travel	10,802,536,236	3%
Public Relations and Awareness	7,201,690,824	2%
Survey & Research	3,600,845,412	1%
Indirect Cost	0	0%

D. Investment Strategy to Achieve Targeted Health Expenditure by 2030

	Baseline (2015)
Population	11,609,666
Health Budget (per capita), Rwandan franc	31,016
Health Expenditure (per capita), USD	44

	2016 - 2020	2021 - 2025	2026 - 2030
Projected Population	12,663,117	14,160,550	15,712,647
Target Percentage Increase	30%	40%	30%
Target Investment (per capita), Rwandan franc	43,125	59,271	71,380
Target Investment (per capita), USD	56	73	86

ANNEX 3

INFRASTRUCTURE – ELECTRICITY

Country Inputs	Values
Starting Electrification Rate (%)	20%
Electrification Rate Goal	100%
Population	38,000,000
Population Growth Rate	3%
Percent of Population that is Urban	16%
Urbanization Rate	5.4%
Rural electricity access rate	10%
Current Spending on Electrification ($)	$500,000,000
People per household	5

Assumptions/Adjustments	Values
Urban Grid Connection Cost	$2,500
Rural Grid Connection Cost	$4,567
Tier 1 Solar Home System Cost	$100
Tier 3 Solar Home System/Mini-grid Cost	$500
Capital Cost to Add 1 MW of Capacity to the grid	$3,000,000

GOAL 7. ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

100% Grid Coverage			Current Percent of Population with Electricity Access	Stated Country Goal for Electricity Access by 2030 (or before) (%)
Target	Indicator	Goal		
9.1 By 2030, ensure universal access to affordable, reliable and modern energy services	9.1.1 Proportion of population with access to electricity	To reach 100% of the population with the grid	20%	100%

Approximate Needs to Meet Goal			Cost to meet goal ($)			
Generation Capacity (MW)	Urban Connections	Rural Connections	Urban	Rural	Total	Annual
4,988	3,214,760	6,760,922	$8,036,895,000	$30,874,875,000	$38,911,770,000	$2,594,118,000

Spending gap based on current spending ($)	
Total	**Annual**
$ 28,122,488,206	$ 1,874,832,547

INFRASTRUCTURE – ROADS

Country Inputs	Values
Length of Roads	
Current Highway Length (two lane - trunk)	0
Current Paved Length (primary and secondary - two lane)	3,264
Current Earth All Season Roads	16736
Population	38,000,000,00
Population Growth Rate	3%
Annual Spending on new roads ($) in 2016 (assumed growth of 5% annually for this value)	$1,000,000,000
Current Spending on Electrification ($)	$500,000,000
People per household	5

Assumptions/Adjustments	Values
Cost per km of paved highway (two-lane) ($)	$828,245
Cost per km of paved road (two-lane) ($)	$276,508
Cost per km of all weather road (two-lane) ($)	$12,683
Average cost of road ($/km)	$218,686
Land Area (km^2)	200,520

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Target	Indicator	95% goal (full coverage) Goal	Current Road Density (km/km^2)	Required Road Density in 2030 to meet goal (km/100km^2)
9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	9.1.1 Proportion of the rural population who live within 2 km of an all-season road	To reach 95% of the rural population. This level can be considered covering the whole population and will bring up the indicator to the level of most high income countries	10	251

Length of road in 2030 to meet goal				Cost to meet goal ($)		Spending gap based on current spending ($)	
TOTAL	Expressway	Paved (non-expressway)	Unpaved	Total	Annual	Total	Annual
502,776	5,361.24	376,010	121,404	$ 105,576,270,907	$ 7,038,418,060	$ 83,997,707,317	$ 5,599,847,155

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